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ESSAY ON VIVISECTION.*

BY MR. W. D. SIMPSON.

(*Continued from page* 331.)

THERE are two modes in which a good may exceed an evil—in quality and in quantity. It may be of a higher class, or it may be of a larger amount; if it should exceed in one and be exceeded in the other, the balance would be very difficult to strike; but if it exceeded in both, the question would be solved beyond dispute. Ease and pain are equivalents in quality; one is a good, and the other is an evil. So let A and B be two individuals of the same nature and exactly alike. If pain be inflicted upon A, by which B is relieved from the same amount of pain, and the relief and the suffering last for the same length of time, it is evident that an exact equivalent has been obtained, but no more. But it may be said although the life of the victim may not be shortened yet, while it is being kept in pain for the sake of all these beneficial results to another, its activities are suspended and its health destroyed. This is true and brings us a step farther. If A and B are exactly equal creatures, the loss of activity to one, is not more than balanced by the gain to the other. But if B belongs to a superior class—much more if he is a man, and A is any other animal—the activities saved will be very much more varied, numerous and efficient than those sacrificed, and the scale will again dip on the side of benefit, for, as a rule, a man is better than a dog. It is now clear that the evil inflicted on animals in painful experiments is exceeded in quality by the good sought to be obtained for man. Ease and pain have now been compared as to quality. The next thing is to compare the two in quantity. We have hitherto been supposing that the pain suffered, lasted as long as the benefit

* Read before the Edinburgh Veterinary Medical Society.

purchased. But this is never the case. The most prolonged painful experiment that could be imagined, would not last many hours, a far shorter time than many an agonising disease. To cure a sick person is generally to give him a period of restored health and efficiency which may be counted by years. The pain passes, the relief remains. The lower creature finds a speedy end to its sufferings in release or death, the man lives on in renewed health and power : what is evil is transient, what is good is enduring. Even in the case, then, of one suffering animal for one man, we see that the good obtained exceeds the evil in quantity because lasting longer, But as a matter of fact, such a simple case of one—versus—one, seldom occurs. The only instance of it is the rare one, when a surgeon tries an experiment upon an animal, for the sake of perfecting himself in it before performing it upon a person. This would seem a most righteous use of vivisection, and all the above arguments would apply to it in full force, even if the subject could not be anæsthetized. When a surgeon knows that the life or death of a fellow-creature, with all the innumerable ties of duty and affection which hang around all human lives that are not desolate is shortly to depend upon his skill, surely it is his duty to fit himself for that solemn charge by every means in his power. But it may be said, such experiments do not always give the expected result. Theories which it was sought to prove by vivisection have been disproved by it ; the results of the experiments have been to detect mistake, instead of establishing positive truth ; false tracks have been started upon and animals have bled and died only to mark "No Thoroughfare," upon some tempting path. But though the result be negative, and the good has been indirect, it has not been less real. Human victims would have paid the penalty of these errors, if they had not been ransomed by others of a lower kind. Whether results are positive or negative, they all go to build up the fabric of an accurate and scientific physiology, upon which the success of medicine chiefly depends. Some people seem to think that if vivisection does not bring forth direct results, it is not real. But these experiments are beneficial to animal and man by the increase of knowledge indirectly if not directly, and as Dr. Sharpey says,—Physiology is not to be compared to the reaping machine, but rather to the plough. Though we cannot always assign the precise share of vivisection in any investigation of which it has formed a part, yet we can always know that, whether it be great or small, it is multiplied by a practically

infinite factor ; while, if it was a painful vivisection, the pain was endured by a limited number of animals for a limited time. Thus the greatest pain suffered for the smallest actual result would in time be fully counterbalanced, since the lowest figure when multiplied by infinity exceeds the largest definite sum. Much more is this the case when the result is large and visible to begin with. From this point of view, the good still exceeds the evil in quantity. It is now when we have proved that even painful experiments upon animals need not be cruel, that we are brought face to face with the true crux of the question. The opponents of such experiments assert that they are wrong in themselves, and that therefore it is time wasted to prove that advantages are gained by them, since no profit can justify a crime. We know that all creatures, human and other, live under the law of sacrifice; and that animals owe their physical prosperity, and men their social union and spiritual elevation, to this law ; in the first place submitted to unconsciously, in the latter accepted more or less deliberately. If we withdraw animals from the natural action of this law, as we do to a certain extent when we domesticate any creature, we withdraw it from the struggle for existence, and substitute artificial for natural selection. We do not allow it to be starved out by stronger competitors, or devoured by wild animals. Are we then bound to make its existence nothing but a pleasurable one? Of course, no one says anything so unreasonable. It is generally admitted that we may chase and kill an animal, often necessarily with much pain, not because its life and liberty interferes with ours, but because its death will render our life more complete, perhaps, in the most trivial detail. We kill them not only that we may have food varied and attractive (compare the amount of food and loss of life implied in the words, sardines, whitebait, shrimps, etc.), but also clothing rich and beautiful (fur trimmings, ornamental feathers, gloves, etc.) What is the proportion here between the satisfying of human needs and the destruction of animal enjoyment? We subject them to painful operations in order to make them more manageable for service, to improve the flavour of their flesh ; and even to please our whimsical fancies, we imprison them in cages and zoological gardens. Again, the most insignificant fly that dances through a summer's day, opens out its marvellous little wings with strength and dexterity, because thousands of other flies have been snapped up by their enemies. The robin pipes his autumn song because dozens of quiet cater-

pillars and writhing worms have been pecked to death to feed that cheery sweetness. It is not all horror. The less goes to make the greater; the imperfect fades before the perfect; the whole creation groans and travails in pains together. Yet the new heavens and earth are ever being born. Much more is this so in the world of men. By this law the human race is solidaire. But the opposers of this science say that our Creator never intended animal flesh to be used by us for food. But that He says, "To every beast of the field, and to every fowl of the air, and to everything that creepeth upon the earth, wherein there is life, I have given every green herb for meat" (Gen. i., 29—30), hence, undoubtedly, the vegetarian theory has the weight of argument on its side, if this be the case. But when this was the case, the whole earth must have been in harmony together. Now, human beings cannot escape from the ills that flesh is heir to, and we declare that it is right and well that one should suffer for the sake of another. There is nothing in it at all revolting to our moral feeling; we live by and under this law; experiments are intended to save more pain than they inflict; and it cannot be cruel, of two sufferings, to prefer the least. Thus why should it be more unlawful to give pain to animals for the purpose of human and animal health and knowledge, than to give pain for the purpose of human convenience, pleasure, business or food? The next question which we may ask is, What is Vivisection? Literally, of course, the cutting of a living thing, such as crimping a cod or foxing a terrier. Sir Thos. Watson rather vaguely explains it as "the cutting into any living animal for scientific purposes." Vernon Lee says that "Vivisection is a generic name for torture," an expression of which much meditation has hitherto failed to reveal the meaning. Webster's Dictionary gives it as "The dissection of an animal while alive, for the purpose of making physiological investigation." Probably this is a fair statement of the popular notion. Many people suppose that just as the anatomist lays bare nerve after nerve, and muscle after muscle in a dead body, tracing each from its source to its remotest ramification, until he is thoroughly acquainted with its position and relations, so the physiologist studies the functions of living organs, displaying them and watching their working in the living body, and making each subject serve for as many experiments as possible, until death renders it useless; nothing less than such an idea will justify the language used by some of the anti-vivisectionists about "the most cruel of cruelties." Still, it is rather out of date, for it is about 200

years since it represented any existing fact. No doubt the anatomists of the Middle Ages did cut open living bodies to see what was going on inside; but now the coarser structure and general relationships of the principal organs are understood and taught on the dead (human) subject, which in olden times was out of reach of the most skilled anatomist. The experiments now performed on living animals are delicate and difficult; they require much time and expensive instruments; some of the most important involve very little operating, and there is nothing at all corresponding to dissection or cutting up. Webster's definition is therefore misleading. One might speak of vivisecting a plant, for there is vegetable life as well as animal, and it is certainly vivisection to cut up a tissue which is itself living, though removed from a dead animal. But this sort of thing is not what people mean when they talk about vivisection. They mean making any experiment on animals which gives them pain, whether there is a cutting in it or not. They generally have some loose ideas about dissecting alive, like Mr. Webster's, and the more careless or dishonest of them throw in "torture" as a natural accompaniment, without waiting to inquire into the degree of pain caused. Only a small part of the work done in physiological laboratories consists of such experiments; but though their proportion to the rest is small in quantity, it is large in importance. Both statements will be best explained by a short review of the various sections into which practical physiology is divided, both in text books and in teaching establishments. These will usually be found to be four, *i.e.*, Histological, Chemical, Physical, and Vital Departments. In the first, the pupil studies, by means of the microscope, the minute structures of the tissues of animals and plants. A small portion of living tissue is often studied in this department, but then it has been taken from a dead animal. Everyone, perhaps, may not know that the tissues have an independent life, which may survive for some time the death of the organism, if that has taken place while they were in health. This study of life, without a living creature, is not vivisection in the popular sense. On the whole, then, it is clear that in the histological department, which constitutes, probably, one-fourth of the whole laboratory work, there are no painful experiments.

Secondly, is the Chemical Department. Here the student learns the nature and composition of the secretions and excretions, how to test them and judge of their character—knowledge which will be most important to him in diagnosing

disease, but in gaining which he works on fluids brought to him in the laboratory, collected painlessly from living beings or animals, or extracted from the gland structure of dead animals. Here there is no cause of dispute.

Thirdly, the Physical Department is that in which the forms of nature are studied in their relation to vital phenomena. Here is provided an elementary knowledge of the laws of dynamics and mechanics; at any rate, nothing takes place in this department which need excite any horror or raise any moral discussion.

Fourthly: The Vital Department is that in which painful experiments on living animals take place, but they are very far from forming the whole of its work. As in the first department, experiments are often upon living tissue from a dead creature. Next come experiments upon entire animals deprived of consciousness and partly of life by pithing. The creature is put under an anæsthetic, and the spinal cord is divided, oxygen being applied to the blood by artificial respiration, or the creature would die. We now come to experiments more nearly corresponding to the popular idea of vivisection: that is, those which involve incision or cutting are performed on living creatures. To begin with, it cannot be too often repeated that in England animals are never cut up nor dissected alive in order to show the relations of their parts. This is taught, as has already been explained, by means of dead subjects, models, and diagrams. Painful experiments are therefore confined to purposes of original research, and in the few cases where pain must be given, it is generally very slight. Then there remain a number of experiments which cannot be further classified relating to the various animal functions, varying according to the points which scientific men desire to ascertain. So that in these vivisections there is always a definite object in view, and these are only resorted to when the question in hand cannot be solved by chemistry, histology, or any other of the means at command. The random "experiment" under which we hear of creatures expiring in torment exists only in the minds of certain excitable, but ill-informed writers. Yet vivisection is described as the "worst form of cruelty we know," and the words agony, torture, and torment are scattered about as if no such things existed as chloroform, ether, or morphia. For anæsthetics are always used where possible. If an experimenter did not use them for the sake of humanity, he would for his own convenience. Can anyone suppose that it is agreeable for a man conducting a difficult investigation to

have the subject crying and restless, when he requires perfect stillness for the sake of his delicate instruments, and undisturbed concentration for his own mind? An anæsthetic is absolutely necessary for the success of most operations, and equally needful for the feelings of most operators. Doctors are men—men, the whole object of whose lives is to relieve suffering, and whose feelings are constantly cultivated by demands on their help and sympathy, their skill and tenderness. Working physiologists share these influences: they are not a caste of Fakeers cut off from all the gentleness of life, and vowed neither to pity themselves nor others. Why should it be supposed that they like to hurt a helpless creature lying at their mercy? ("Why should it be said that they have blunted their physical and mental processes, and weakened the power of their will by the habit of experiment, and that the animal experimented upon is regarded by them more as a vivified machine capable of imparting knowledge than a sentient being?"—Abiathar Wall, M.R.C.S.E., etc., "Vivisection Scientifically and Ethically Discussed," January, 1881.) Often-quoted evidence is alone sufficient to show that no such charge against them could for one instant be supported. If anæsthetics are not constantly mentioned in text-books, it is because their use in every laboratory is taken for granted.

We may now state the relation of vivisection to physiology.

All treatment of the sufferings of mankind must fall into one of two classes—the physiological and the non-physiological. The former is founded upon a knowledge—the more thorough the better—of the mechanism with which it has to deal. So far as the physician knows the structure of the body with which he has to deal, the relations of its functions and the working of its organs in health, so far he can recognise disease, trace its causes and consequences, and calculate upon the effect of the treatment which he adopts; so far he is working in the light, and is likely to succeed. But so far as he is guessing, theorising and experimenting on his patient, so far he is groping in the dark, and is likely to fail, or in other words, rational therapeutics are based upon sound physiology. But is the physiological system of medicine firmly founded upon knowledge that can be relied upon? and if so, what share has experiment had in attaining this knowledge? No physiological discoverer was ever a vivisector and nothing more; yet they have all been vivisectors. He did not spend his time in the "random experiment" in which his profession was supposed to delight. While his

mind was open to all ideas, his thoughts were bent on one. He learnt what anatomy could teach him of the matter in question; he watched in practice, and observed accidental circumstances; he studied the doings of other workers and meditated upon them. All these things—anatomy, clinical observation and meditation—are absolutely necessary. But this manner of accurate investigation cannot dispense with the additional means of experiment on living animals, for it is really the touchstone by which theories starting from the other methods are judged, and the results obtained from them are studied. In order to trace, as briefly as possible, the dependence of physiology upon experiment, we must take some of its branches and inquire what were the earliest ideas held on these subjects; what knowledge upon them we have arrived at, and what share experiment has had in leading us to this point? To begin with, then—The Circulation of the Blood.

The arteries were first said to contain air; but Galen (who flourished 131—201 A.D.) was a diligent experimenter, and vivisection soon taught him that this was not the fact. He says: "If one cut many arteries at the same time they will all let blood escape,"—now a fact known to all the world. He, however, thought that they carried both blood and air, and that their chief business was to conduct air (or vital spirits, as he called it,) from the heart to vivify the whole body. The nourishing material from the food was collected (according to his views) by the gastric and intestinal veins, and carried to the liver, where it was made into blood, which was then distributed to the various parts of the body by the systemic veins. Some of the fresh blood coming from the liver flowed through the right side of the heart, and was conveyed to nourish the lungs by the pulmonary artery. He thought that the current flowed backwards and forwards, in the arteries and veins alike, the former carrying the nutritive the latter the vital blood. This curious mixture of fact and fancy was all that was attained by the first great experimental physiologist, and was due to vivisection, and which convinced him (in spite of his former theory) that all the arteries contained blood. Although he had gone thus far in 200 A.D., yet at the beginning of the 17th century we find knowledge of this subject in much the same position. How was this? Had not doctors been practising and reflecting upon what they saw during those 14 centuries? They had. Vivisectors they were, in the true sense of the popular meaning, who really dissected living subjects in order to study the parts of the

body; but these were anatomists, not physiologists. The experiments that were performed were not sufficiently numerous, careful, or efficient, or systematic to produce any result worth mentioning. In 1628 A.D., Harvey picked up the wonder-working rod that had fallen from the hand of Galen, and physiology moved on again. It was one of the greatest strides the science ever took at one time. This discovery was to physiology what that of the law of gravitation was to physics. Harvey did not know all the details of the course pursued by the blood, especially of the manner in which it made its way from the arteries into the veins. Malpighi, who was the father of minute physiology, was the first to see it in the capillary vessels, which he demonstrated by vivisection on a frog, and thus added the last link to Harvey's chain of evidence. Of course, to state fully all these experiments, and their relative value, would take up much more space than I can spare, so I am assuming, gentlemen, that with your knowledge of physiology you will be able to follow the context in the brief way in which I have stated it. To sum up, then, let us see what amount of our knowledge of the blood and its circulation is due to experiments on living animals. In this manner we have learnt that the arteries contain blood (Galen); that it is driven into them by the pumping action of the heart under high pression, and so forced through the body, and that the veins collect it and return it to the heart (Harvey); that it passes from the arteries to the veins through capillaries (Malpighi); and that it conveys solid nourishment and formative agents to the tissues (Waller and Cohnheim). We can measure exactly the force of its pressure against the vessels which contain it (Hales, Poiseuille, and Volkmann), and we understand the manner in which these vessels contract and dilate, and the nervous system which causes them to do so. The question to be asked from this is not, When is such knowledge as this useful? but, What act or conclusion in medical practice is independent of it? Closely connected with the circulation of the blood are the flow of the chyle and lymph in their capillaries and vessels. These are said to have been discovered—I mean the lacteals—by an Italian anatomist, Asellius, in 1662 A.D. Up to that time the absorption of chyle was supposed to have been the sole business of the mesenteric blood vessels.

(*To be continued.*)

OBSERVATIONS ON THE RELATION BETWEEN THE HORSE'S BODY WEIGHT AND THE WEIGHT OF ORGANS.

BY O. CHARNOCK BRADLEY.

THE accompanying table gives the result of observations extending over several sessions, and conducted in the dissecting room of the New Veterinary College, Edinburgh. The subjects from which the organs were taken were mostly dissection subjects of ages varying from about nine or ten years upwards. In most cases it was impossible to ascertain the exact age; some few of the animals were comparatively young, and had died from disease; the majority, however, had been killed, while in a normal state of health, for the express purpose of anatomical study.

The body weight was ascertained at least twice during life, and an average struck. It is interesting to note that the body weight varied very considerably in the same animal at different times; but no definite and satisfactory figures could be arrived at. I intend, however, as opportunity affords, to further investigate this variation, as it does not seem to depend wholly upon the amount of food partaken of, but is probably to be accounted for, in part at least, by the accumulation of intestinal gases which, as is familiar to all who have made autopsies immediately after death, is sometimes considerable, at other times only moderate in amount.

It is interesting to note that the most variable organs were the heart, liver, kidneys and lungs; the other organs being much more constant even where the body weights varied greatly. The most constant organs were the urinary bladder, pancreas and brain.

The following is a list of the most important extremes:—

Liver ..	8 to 14 lbs.	Stomach..	3 to 4 lbs.
Spleen ..	2 to 4 lbs.	Heart ..	5 to 10 lbs.
Kidneys.—Right ..		.. ..	$13\frac{1}{2}$ to $22\frac{1}{2}$ ozs.
Left ..		.. ..	$11\frac{3}{4}$ to 21 ozs.
Lungs.—Right ..		.. ..	.. 4 to 9 lbs.
Left ..		.. ..	.. $3\frac{3}{4}$ to $8\frac{1}{2}$ lbs.

The average body weight was found to be about 950 lbs; this result being arrived at, it will be remembered, by at least two weighings of the same animal during life. The dead weight was not ascertained.

Any organ showing the least abnormality was rejected.

In the following table the body weight is taken as unity; the weight of organs being expressed as fractions:—

Relation between Weight of Organs and Body Weight of Horse.

Body weight	= 1	..	av. weights.
Liver	= $\frac{1}{85}$	..	9 to 12 lbs.
Spleen	= $\frac{1}{280}$	.	2 to 4 lbs.
Heart	= $\frac{1}{160}$	..	5 to 6 lbs.
Right lung	= $\frac{1}{130}$	..	.. 7 lbs.
Left „	= $\frac{1}{150}$	..	.. 6 lbs.
Stomach	= $\frac{1}{250}$	..	3 to 4 lbs.
Right kidney ..	= $\frac{1}{730}$	..	.. 22 ozs.
Left „ ..	= $\frac{1}{860}$	..	.. 20 ozs.
Brain	= $\frac{1}{730}$	..	.. 22 ozs.
Spinal cord	= $\frac{1}{1440}$	..	.. 10 ozs.
Pancreas	= $\frac{1}{930}$	..	.. 1 lb.
Bladder	= $\frac{1}{930}$	..	.. 1 lb.

It is interesting to compare the weights as given in some of the more familiar English works on veterinary anatomy with those arrived at in the above observations; I append a table to show such a comparison:—

Organ.	Authors.			Own Observations.
	Chauveau.	Percival.	Strangeways.	
Liver	11 lbs.	——	10—12 lbs.	9—12 lbs.
Pancreas ..	17 ozs.	——	——	16 ozs.
Spleen ..	32 ozs.	Up to 3 lbs.	2—4 lbs.	2—4 lbs.
Right kidney. .	27 ozs.	——	——	22 ozs.
Left „ ..	25 ozs.	——	——	20 ozs.
Bladder ..	16 ozs.	——	——	16 ozs.
Heart	6¾ lbs.	6—7 lbs.	6½ lbs.	5—6 lbs.
Brain	22 ozs. 15 drs.	——	23 ozs.	22 ozs.
Stomach ..	3—4 lbs.	——	——	3—4 lbs.

THE PARASITE OF MANGE IN COWS.

BY WILLIAM DAVIS, NEW VETERINARY COLLEGE.

IN THE VETERINARY JOURNAL for February last I gave an account of an outbreak of mange in cattle due to a sarcopt identical with, though smaller, than the acarus found

in the same disease in the horse. In the issue of the *Veterinarian* for the following month, Mr. De Jong, describing the same outbreak, stated that the parasite was not a sarcopt, but the ordinary psoropt of mange of cattle, and added that he was supported in this opinion by the authority of Dr. Brock, medical officer of health for the county, and other medical friends, doubtless of equal eminence. On reading this communication, I obtained the views of several gentlemen whose dictum ought to be regarded as at least of equal value to that furnished by Mr. De Jong, and it abundantly established the identity of the creature as a sarcopt. These opinions I published in THE VETERINARY JOURNAL for April.

Since that issue I received a letter from Professor A. Railliet requesting me to lend him some preparations of the parasite. This I have done, sending him at the same time some of the scales from the skin of one of the affected cattle.

To-day the subjoined letter arrived. Professor Railliet is lecturer on parasites, and is an authority on the subject. One may, therefore, regard it as settled that mange of the ox may be due to a sarcopt, Neumann, De Jong, Brock, &c., to the contrary notwithstanding :—

MINISTERE DE L'AGRICULTURE.

Ecole Vétérinaire d'Alfort,
Le 14 *Juin*, 1896.

MON CHER COLLÉGUE,—J'ai reçu votre préparation et les croûtes provenant d'une vache galeuse, dans lesquelles j'ai pu facilement trouver dés Acariens. Il s'agit bien d'un sarcopte, représentant une variété de *sarcoptes scabiei* (var. *bovis*) voisine de celle qu'on observe sur le dromadaire, le lama et la vigogne, et un peu plus petite que celle qu'on trouve sur le cheval. Il aurait été intéressant de savoir quel avait été le point de départ de l'épidémie que vous avez étudiée.

Si vous désirez d'autres renseignements je serais volontiers à votre disposition.—Bien vôtre,

Monsieur W. R. DAVIS,
Edinbourg.

A. RAILLIET.

Translation.]

MY DEAR COLLEAGUE,—I have received your preparations and the scales from the mangey cow, in which I have been able to find *acarii* quite easily. It is simply a case of a sarcopt, representing a variety of *sarcoptes scabiei* (var. *bovis*) closely allied to the one we find on the dromedary, the llama, and the vicuna, and a little smaller than the one we find on the horse. It would have been interesting to know what had been the cause of the outbreak which you have studied.

If you wish further information I am entirely at your disposal.—Yours faithfully,

R. RAILLIET.

TUBERCULOSIS IN CHICKENS.

BY T. A. BRAY, D.V.S., KANSAS CITY, MO.

IT is not generally known that chickens have tuberculosis, but it is a fact nevertheless, as there is ample proof of it.

A few weeks ago one of the employés in a Kansas City abattoir asked a government inspector what those little pimples were on a chicken he was packing for shipment. It did not take the doctor long to determine what he had before him. It was a well-developed case of tuberculosis. The doctor promptly condemned the carcase.

Last summer my attention was called to a number of chickens that were sick. The owner partly made his living by raising chickens for the market, having about one hundred on hand most of the time. After looking the chickens over, and getting all the history possible, I concluded there was an outbreak of some lung trouble, and told the owner if any should die I would like to hold a *post-mortem*.

As I did not receive any word about any dead chickens, and having some spare time, I dropped in to see the sick ones. It was in the morning, and on arriving at the chicken-farm I noticed a man coughing and expectorating a mixture containing blood. The spring chickens were around him pretty thick, and when he expectorated they would devour it with a relish. I didn't have to ask the man what his ailment was, as he plainly showed it; but thought it no harm to ask him a few questions.

He informed me that his name was Johnson, and that he lived next door to the owner of the chickens, and as there was no division fence the chickens had the privilege of both yards. Every morning that he felt able he would venture into the yard, and usually had a coughing-spell, and expectorated a great deal. The chickens were always on hand to pick up what he coughed up. Mr. Johnson has had a number of brothers and sisters die from tuberculosis, so that it is quite general in his family. His present condition is such that he cannot get out during this weather, and is growing weaker as his case progresses.

By the owner's consent, I killed one of the chickens, and on *post-mortem* found a case of generalized tuberculosis. I also took one of the sick birds to the Kansas City Veterinary College, where a *post-mortem* was held. They also found a generalized case of tuberculosis.

The poultry farm lost a large percentage of their young

chickens, and would have probably lost more if they had not been disposed of before showing advanced symptoms of the disease. The old chickens did not seem to take the disease, as the young birds were very quick in picking up what was expectorated, the old ones not getting a chance at the expectorated germs.

Symptoms.—Standing about in a sleepy state; breathing accelerated. Other chickens picking at sick ones. Frequent coughing, which brings up a discharge from the lungs, and in the advanced stages this discharge can be found on the feathers of the back where the bird rests its head during the time it sleeps, the cough frequently disturbing its rest. This discharge dries on the feathers, and there is a great deal of it if the case has been long standing. The chicken becomes very much emaciated as the disease progresses.

Post-mortem.—Liver, lungs, and walls of thorax showed evidence of tuberculosis, which was quite plain to the naked eye.

Conclusion.—Chickens, as we all know, are extensively used for human food, and should be inspected as well as other food products. Some of our abattoirs slaughter poultry on a large scale.

POISONOUS PLANTS OF THE HEATH FAMILY.

BY R. STEWART MACDOUGALL, M.A., B.SC.,
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A FEW days ago a specimen of a plant, the eating of which has caused the death of some sheep near Kendal, was sent to me for identification. On examining it, I found the plant which had caused the harm to be *Andromeda floribunda* (*Pieris floribunda*).

As I have several records of the baneful results to stock following eating of the leaves of this plant, I purpose giving a short account of the plant in order that veterinarians may be on their guard against it, at the same time adding some details as to the poisonous properties of allied plants of the Natural Order *Ericaceæ*, as far as these have been investigated.

The well-known gamopetalous Order *Ericaceæ* includes (broadly speaking), the familiar heather, the showy rhododendrons and the hardy and ornamental andromedas, while the closely-allied and also shrubby Order *Vacciniaceæ* numbers among its members the bilberries and the cranberries.

The genus *Andromeda* was so named by Linnæus who, while contemplating one of its drooping rosy-flowered mem-

bers—a dweller in boggy situations—and seeing that the swamps in which it grew fled before the summer's sun else the fair plant had been overwhelmed, likened the plant to the fabled and fair heroine Andromeda, whom students of mythology will remember to have been chained to a rock by the order of Neptune, where she was likely to have been devoured by a sea monster, when Perseus appeared, turned the monster into stone, rescued Andromeda, and married her.

The genus, consisting of shrubs and small trees, has a fairly wide distribution in Europe, Asia Minor, and America, but only one species is native to Britain, namely *Andromeda polifolia L.*, the marsh andromeda. This shrub, with slender erect stems, is found in Ireland and Great Britain as far north as Perthshire. As its names indicates it is a lover of damp, peaty situations. The leaves green on the upper surface and greyish-white below, have a well marked mid rib. They are oval, with their margins rolled back and a short stalk. The petals are purple and the corolla pink. The fruit is a capsule. The leaves and young twigs are poisonous.

Although *Andromeda floribunda*, the bundle-flowered andromeda is not native to Britain, it was introduced from America about 1812 as an early ornamental shrub. The plant varies in height from two to six feet. The coriaceous leaves are oval and finely toothed. Clusters of white flowers are produced in April and May. That the plant is dangerous, and that stock should be prevented from having access to it, will appear from the following :—

In the case near Kendal four ewes and a lamb had strayed into a garden which had no gate and eaten of the leaves. All alike, after eating, showed signs of abdominal pain, accompanied with great difficulty in swallowing. The sheep were ill from 12 to 15 hours. One ewe recovered. In the *Gardeners' Chronicle* for March, 1866, the ill effects following to a number of sheep which had eaten our plant are stated as follows :—"Mr. Deacon, of Mapledon, has recently lost no fewer than eighteen sheep through their eating a poisonous shrub. It appears that a short time ago the gates leading into the pleasure grounds were left open, and thirty-eight sheep, which were grazing in a field near, strayed into the grounds, and while there ate ravenously of *Andromeda floribunda*, a most poisonous American shrub. The bailiff at once treated the sheep, thirty-seven of which showed symptoms of poisoning, and then called in Dr. Gregory, and under their united treatment nineteen of them recovered."

Again, in the 1878 volume of the *Gardeners' Chronicle*, we read of a valuable horse being lost through eating a small quantity of *Pieris floribunda*. The horse was working a mowing machine, and during the absence for a few minutes of the men in charge, it ate a very little of *Andromeda floribunda*, and died in great agony in less than twenty-four hours. The contents of the stomach were examined and found to consist of a small quantity of the shrub, and this mostly the flower-buds. Mr. Lindsay mentions another case in the Royal Botanical Society of Edinburgh's Transactions, 1892:—"The sheep were put into the field at Falkirk on a Saturday, and by five o'clock next day five of them were ill, after nibbling at *Andromeda floribunda* in a shrubbery running along one side of the field. The first death occurred on Sunday night and the second on Monday morning; two of the others took two days to recover, and another three days. In a *post-mortem* flowers and leaves of *A. floribunda* were found in the stomach, more flowers than leaves."

The general characteristic of the Natural Order *Ericaceæ* and the allied Vaccinias is astringency. The great Bilberry (*Vaccineum uliginosum*) produces berries which, if eaten greedily, cause giddiness. From the berries of *V. vitis-idæa* the red Whortleberry or Cowberry, a biting acid principle has been isolated termed Oxyococcin, and the bitterness of Cranberries has been ascribed to the same.

From the leathery-leaved members of Ericaceæ, such principles as arbutin, ericolin, and ursine have been isolated, while of frequent occurrence through the Order are gallic acid, wax, resin, tannin, volatile oils, etc.

But it is the more harmful—the poisonous—principle that I wish to call attention to. At home owners of stock have always been suspicious of Rhododendrons; while abroad, say in India, where they are native, their dangerous qualities when the plants were used as food, have long been recognised. So, too, with the Andromedas. Experimental research, Eykman, Zaayer, and Pflugge being the chief workers, has led to the discovery and isolation of a poison, to which the name of Andromedotoxin has been given, and this is the poisonous principle in all the narcotic Ericaceæ. Experimentally, one-twelfth grain has been found sufficient to kill a rabbit. This colourless crystalline, poisonous glucoside, was first of all detected in *Andromeda japonica*, and continued researches have shown its presence in many other Ericaceous plants. Pflugge's formula for it is $C_{31}H_{51}O_{10}$. No chemical antidote is known. It may prove useful if I give

a list of such plants, adding here and there a note in extension.

Plants of the Natural Order Ericaceæ proved to contain Andromedotoxin.

Andromeda japonica, leaves and wood; *Andromeda polifolia*, leaves and young twigs; *Andromeda Catesboli*; *Andromeda calyculata*, leaves and young twigs; *Pieris formosa*; *Pieris ovalifolia*. The late Dr. Cleghorn writes of this plant being well known to the shepherds of the Himalayas, where goats browsing on its young leaves have been poisoned. Its Indian name of blood-killer is interesting, as is also the observation that its leaves used as litter act as an insecticide in the cattle-stalls. Its honey is also poisonous. *Kalmia latifolia* and *Kalmia angustifolia*, the latter known popularly as lamb-kill.

Rhododendron ponticum. Sheep have been known to die the day after eating its leaves. Honey also poisonous: *Rhododendron Falkoneri*; *Rhododendron grande*; *Rhododendron barbatum*; *Rhododendron fulgens*; *Rhododendron punicum*; *Rhododendron chrysanthemum*; *Rhododendron hybridum*; *Rhododendron maximum*, leaves and flowers; *Rhododendron cinnabarinum*. Its leaves are poisonous, and if the plant be burned, the eyes smart, and the face swells; *Azalea indica*, leaves and flowers.

Monotropa uniflora, parasitic on the roots of other plants. Entire plant poisonous.

Other members of the Order which, as far as I have been able to find out, have not yet been investigated, but are known practically as dangerous plants, are:—*Andromeda mariana*, the stagger bush; *Rhododendron arboreum*. This poisonous Rhododendron is a native of India, but has been grown at the Edinburgh Royal Botanic Gardens. According to Watt, the natives of India sometimes eat its flowers, which have a sweet, acid taste, and eaten in quantities, cause intoxication. This species produces a great deal of poisonous honey.

Rhododendron anthopogon. Another Indian form growing in the high mountain passes, its resinous odour causing headache to travellers over the passes. Even when the plant is dried and in a herbarium, the odour is unpleasant.

I desire to thank Mr. Rutherford Hill for giving me access to some of the literature on the subject.

Cases.

FRACTURE OF THE PELVIC VERTEBRÆ FOR A TIME WITHOUT DISPLACEMENT.

ON the evening of March 26th a message arrived at the surgery requesting our attendance at the stables of J. G. Mackie, Esq., Auchencairn House.

On my arrival, at 10.30 p.m., I found the patient to be a dark brown hackney mare, five years old. The mare was lying on her off side in a loose box, where she seemed very comfortable and contented.

On inquiring into the history of the case, I was informed that they were breaking the mare into harness, that she had been very wicked, and had frequently thrown herself down very violently when in yoke. She was last in harness on Thursday, March 19th. On account of the bruised and swollen condition of her legs from kicking, she had not been in harness, but had been daily exercised in the saddle. The bruised condition of her legs made her move stiffly.

On the morning of Thursday, March 26th, she was being

exercised as usual when, about a mile from home, she suddenly fell lame in her near hind leg, and in consequence had to be led back to the stable, where she was put into a stall. In about an hour she laid down, and lay quietly for some time. When, however, she attempted to rise she had some difficulty in doing so, but with a little assistance she was able to get to her feet. She was then put into a loose box where she lay down, and was afterwards able to rise without difficulty.

When acquainted with the history of the case, I got the mare on to her feet. She arose as if nothing was the matter with her. When standing, she did not put much weight on the near hind limb. When first moved, she carried the affected limb forward with a circumductive movement, which passed off after she had gone a few yards. There was a local circumscribed perspiration over the region of the hip joint, with clonic spasms of the gluteal muscles on the affected side.

On external examination, nothing could be detected except a slight pain evinced on pressure over the region of the trochanter of the femur.

Rectal and vaginal exploration were next resorted to, but both with negative results.

From the history of the case and the presence of clonic spasms of the gluteal muscles, I thought I had a case of azoturia to deal with, so the catheter was introduced to withdraw the urine, which was found to be normal.

Temperature, 100° F.; pulse, 52 and full. The visible mucous membranes were of a normal colour.

Diagnosis.—Injury to the trochanter major of the femur, and the insertion of the muscles attached to it.

Treatment.—I had the region fomented with hot water for half an hour, and then applied a cooling embrocation. This seemed to relieve the patient, because she walked round her box and bore weight on her limb. The circumductive movement had disappeared. I next administered three grains of morphia hypodermically, and after waiting half an hour, left her for the night, leaving instructions with the groom that he had to look into her box occasionally, and that I would call to see her early in the moring. 12.30, mare in recumbent position and easy; 1.30, standing, bearing weight on the limb and eating hay from the floor; 2 a.m., recumbent and easy; 3.15, the groom hears her fall, and rushes into the box to find her breathe her last without a struggle.

March 27th we received a telegram at 8.15 a.m., informing

us that the mare was dead, and that they wished a *post-mortem* examination to be made.

On arriving at 11.20 a.m., I was informed by the groom that the mare was lying as she had died, that they had not touched her since. On going into the box I found her lying with both hind legs out from the body, and resting on the sternum. The abdomen was greatly distended. When punctured, however, much to my surprise, only a small quantity of gas escaped.

The carcase was now drawn out of the box into a field. I proceeded to skin the animal, and found extensive discolouration with transfusion of blood in the region of the hip-joint and inner aspect of the thigh and groin, which had bands of lymph running through it, thus showing signs of becoming organised.

On opening the abdominal cavity a large quantity of blood escaped. The liver, spleen, and abdominal viscera were all healthy. The thoracic viscera were also found to be healthy. In fact, everything looked as if the animal had been bled. On tracing back the arteries given off at the iliac quadrification, the external iliac on the left side, together with various other smaller vessels, were found to be ruptured. This accounted for the internal hæmorrhage.

After carefully dissecting away the muscles attached to the pelvis, there were surprises in store consisting of the following fractures: Fracture of the posterior iliac spine on the right side; of the symphysis and body of the pubis on both sides; fracture of the symphysis ischii and ramus of the ischium on the left side.

Remarks.—From the foregoing case it will be seen (1) that the fractures had been caused by the animal kicking and throwing herself down when in harness; (2) that the fragments had been kept in position by the periosteum covering the bones; and (3) after I had seen the case, the fragments had become displaced. causing injury to the vessels and internal hæmorrhage, which was the cause of death.

TWO CASES OF PERSISTENT HYMEN.

BY GEORGE N. KINNELL, PITTSFIELD, MASSACHUSETTS, U.S.A.

I.

An aged roadster mare, of no particular breed, was stinted to a French coach-horse, Prince d'Or. On attempting copula-

tion, the penis would not penetrate more than a few inches, when the mare would commence cringing more than they ordinariiy do, and the stallion screaming, would rear up and dismount.

Manual examination revealed a persistent hymen in the form of a strong fibrous cord. Dilatation of the vulva with the hands, and moderate traction on the cord, readily brought it into view, when it was seen to consist of white fibrous tissue, about two-and-a-half inches long, and running transversely across the genital passage. At its central part it was round, about as thick as a man's thumb, and very tough and hard.

Towards each extremity it became flattened out antero-posteriorly, taking on the character of a thick. tough membrane, and was firmly attached to each side of the vagina.

II.

A three-year-old cow at her first parturition. Animal had been in labour for twelve hours; rectum protruding, vulva apparently much swollen, the enlargement having a pronounced conical shape; two feet projecting a few inches from the orifice. Attendants had pulled repeatedly on the projecting members, but without any effect other than to cause the patient distress.

Exploration with the hand discovered the calf's nose and face wedged firmly against the roof of the vagina, while tight under its jaws was a hymen answering in all essential features to case No. 1.

In both cases dilatation and retraction of the labiæ of the vulva, with slight traction on the hymen, readily brought it within sight and reach. Section with an ordinary bistoury was all the treatment adopted or required.

Note to Case II.

The feet and head were returned to the womb before section was attempted, immediately after which the cow delivered herself of a live calf.

Twenty minutes later, on giving the patient the usual parting glance, it was discovered that the cow had laid down, commenced straining, and had everted the entire body of the womb. The organ was quickly returned to its place, the vulva secured by three deep sutures, and the animal banked up in the ordinary way. She made a speedy and complete recovery.

FRACTURE OF THE SCAPULA.

BY W. R. DAVIS, M.R.C.V.S., NEW VETERINARY COLLEGE.

BAY van horse, seven years old, admitted to the College infirmary suffering from a jagged wound about the middle of the anterior region of the scapula. The patient had been run into by a runaway horse attached to a dairyman's van, the shaft of which had inflicted the wound. The poor brute seemed to be almost in a state of collapse, was excessively lame, and offered no resistance, and, indeed, took no notice when the finger was introduced into the wound, which went forwards and inwards for about four inches, forming a large but rather superficial cavity; in a superior direction the finger went upwards and inwards through a gap in the antea spinatus muscle, and in the depth of this part of the wound the anterior edge of the scapula could be felt; it was ragged and denuded of periosteum, and bits of the bone were embedded in the muscles around.

The treatment consisted in enlarging the wound in the muscle somewhat so as to favour the extraction of portions of the fractured bone. Several small pieces were removed; one, however, hooked up from the inner aspect of the scapula by the finger and a pair of forceps, was 2½in. long by 2in. broad (the finger could easily go round the ragged anterior border of the scapula). The shoulder was well fomented and the wounds freely injected with antiseptics twice a day for the first fortnight, after that once a day only.

A stimulant was given to revive the horse on the night of the accident. After standing three days the animal used to spend most of its time lying down, merely getting up to feed, and quickly going down again.

Four weeks after the accident very little lameness was observable, and to-day the horse walks and trots sound, and the wound, which has quite ceased to discharge, is almost closed.

The discharge was rather profuse for the first fortnight, but had at no time the slightest fœtor. This case emphasizes the fact that, however advisable it may be to make dependant openings to drain away the discharge from wounds, and such openings when it is difficult, or, as in this instance, impossible to obtain them, may very well be dispensed with provided one can keep everything aseptic.

AN INGENIOUS AND USEFUL DEVICE.

BY D. MC NAUGHT, V.S., RAPID CITY, MANITOBA.

In all our veterinary literature I have never seen any appliance to keep a poultice on the knee or hock of a horse or cow, and such things as poultices, cold and hot appliances, are constantly necessary in our practice, in broken knees, kicks, and wounds of various kinds. Where city practitioners have an infirmary with all the appliances for the continued application of hot and cold water, etc., many things can be done. But most of the actual practice is done in farmers' stables, where no appliances are at hand. There a man must be shifty and suit himself to his surroundings.

A very bad case of broken knees brought out this simple little invention, and I now give it to the profession for what it is worth. It is both simple and cheap, and can be made by any veterinarian, and there is no patent on it.

It consists of two straps and seven pieces of hoop-iron as light as will sustain the weight of the poultice. The straps are ten inches long and three-quarters of an inch wide, of good stout leather, with a buckle on one end. Lay down the straps fourteen inches apart, or whatever length is required for the animal under treatment; cut off seven pieces of light hoop-iron three-quarters of an inch wide, with two holes in each, rivet on with short copper rivets, keeping the head inside on the leather, then in a vice, or any other way handy, turn over one inch. Then turn the last inch up, having previously rounded the corners so as not to catch or tear the application. Take a soft rag and wind around the lower strap so as to make it rest easy on the foot; also a small quantity around the top so that it will adhere more closely to the leg. This appliance can be made by any handy man at a cost of not more than fifty cents, and will last for many years by keeping the band-iron well oiled.

Editorial.

MEDICAL *VERSUS* VETERINARY EXAMINATIONS.

Since the June number of the Veterinary Journal appeared the General Medical Council has held a sitting and issued its edicts and reports. As these are, naturally enough, regarded by our profession with a considerable amount of respect, and as they will unquestionably affect our future legislation, I give the following slightly—but in no important

point—abridged report, taken from the *Scotsman* of 10th June:—

A report by the Education Committee on the preliminary examinations held in the United Kingdom was also presented by Dr. Batty Tuke. It was stated that questions had been raised in reference to the preliminary examinations of the Scottish Universities as to the precise application to be given to the following note appended to the Council's regulations, namely—"(*a*) The Council will not in future accept any certificate or pass in preliminary examination in general education unless the whole of the subjects included in the preliminary examination required by the Council for registration of students of medicine have been passed at the same time." The committee had understood this note to indicate that the Council required in the case of what might be termed the ordinary preliminary examinations that the candidate's knowledge of the four prescribed subjects should be such as to enable him to pass in them all at one and the same time. In the case of the more advanced examinations, however, such as those conducted by the Universities (or accepted) by them as qualifying for graduation in Arts, the Council did not insist that all the subjects should be taken simultaneously, these examinations being of wider range and higher standing than the others. The Joint Board of Examiners for the Scottish Universities, who had the control and supervision of the preliminary examinations for admission to the Universities of Edinburgh, Glasgow, Aberdeen, and St. Andrews, had framed regulations which, in the opinion of the committee, were quite in harmony with the spirit of the Council's requirements. They prescribed that the requirement of passing in all the subjects at one time might be relaxed in the case of candidates who had already in one or more of the required subjects obtained the honours or higher grade "leaving certificate" of the Scottish Education Department. In the case of the preliminary examination for graduation in Arts, conducted by the same Board, it was proposed that all the required subjects, other than those taken on the higher standard, must be passed at one or not more than two examinations, and this rule was found to work well. The committee were satisfied that in view of the existing standard, as fixed by the Joint Board, this provision might safely, and also with general advantage, be extended so as to apply to the preliminary examination for graduation in medicine. It was accordingly proposed that in the list now issued the condition appended to the preliminary examination of the Scottish Universities should simply prescribe that the certificate was to include the required subjects.

This opens up a new vista of difficulties for our self-styled reformers, and prepares a way for the introduction of fresh complications. Are we in future to accept certificates from the Scottish Universities for the admission of candidates to our veterinary schools, or are we to disdain and refuse them as "debased certificates" because they now afford no guarantee that all subjects were passed at one and the same time? Or are we to ask the Deans of the Faculty of Arts—who control all preliminary examinations in our Universities—to separate the sheep from the goats for *us*, whilst they send an indiscriminate crowd into the medical classes? I should like to hear what Professor Chrystal or Professor Ramsay would say to such a request. If we accept the University

certificates, as being of higher character than others, we shall certainly have to proclaim the exception in our code of regulations, and we shall have to admit thereby that the sanctity of the Four Subjects has been invaded. Then it may be that other educational bodies will petition the Medical Council and ourselves for relaxation of our iron laws, when they find young men who are willing to take two difficult subjects at a time, and repeat the process, rather than to take four easier ones at one sitting, leaving their examinations for those of the Universities. What are we to do then? Treat each case on its merits? This implies a great deal of skill in non-professional matters on our part, and a great deal of work of a delicate and invidious nature. Of course, we may follow in the track of the Medical Council, and humbly say "Amen" to all their proposals, but it seems to me that the shibboleth of the reforming party is in danger of becoming either a snare or a mockery; a snare if they attempt to make it universally applicable; a mockery if they don't.

On the other hand, if we are to refuse the "debased certificates" of the Universities, are we not in the somewhat ludicrous position of demanding more from our candidates than the medical profession does? This is so obviously absurd that it requires merely to be stated in order to be rejected. Yet it is a real difficulty for my opponents, and unless they are prepared to come to reasonable terms regarding this matter, they will find themselves in an extraordinary dilemma. They cannot make a hard and fast rule, any more than the Medical Council has been able to do so; they must make exceptional terms for exceptional cases and the only point is, what are those exceptions to be? That is my question and I am prepared to debate and discuss it in a calm and reasonable way.

I do not go into the proposal made by someone that we should hold preliminary examinations of our own. That is work which is much better accomplished by the existing educational bodies than it could be by us. These bodies have all the necessary apparatus for examining candidates and they can accomplish the work not only better but much more cheaply than we could do; they are all under public or national control and dare not, even if they would, misconduct themselves or falsify their statements; otherwise they endanger their very existence. But apart from all this we have complete confidence in our academic and scholastic authorities and even regard them with pride.

I sincerely trust that no base or unworthy motives will

influence my professional brethren in discussing this question. I go upon the assumption that they are really desirous to raise the educational standard of the veterinary profession and of the country in general, and not selfishly anxious to curtail seriously the number of the youthful candidates for the profession, perhaps even to cut off the supply altogether and close the schools. Should anyone, yielding to the promptness of adversity, adopt such a method of benefiting himself, I will give him a word of warning dictated rather by sorrow than by danger or contempt. A clergyman once said in the course of an eloquent sermon, "Some men say that religion has done much harm in the world, that it has caused endless strife, fathomless misery, wars without number, and these men would abolish religion; to them I answer "You may shut up to-morrow all the churches in Christendom, but you will not thereby get rid of religion: you will merely open the door to some form of gross, and hideous, and uncontrolled 'superstition.'" So in worldly affairs; you may close the veterinary schools by a slow process of starvation or otherwise, but you must not think you are going to have a good time of it for ever afterwards; you are only encouraging the birth of the vilest and most unscrupulous quackery, bound by no code of honour, following no principles, guided only by greed and envy. Be assured, the days of selfish monopoly are over; the nation will stand no re-introduction of them; it insists on its pennyworth, it grants privileges only when corresponding responsibilities are undertaken, and it watches the privileged classes very carefully. I welcome everything in the way of reform, and I think that every institution is in constant need of reform—properly understood, because stagnation generally means decay and death; only let reform be wisely and generously conducted, and don't let us cut off our legs because we happen to have a sore toe.

Proceedings of the Royal College of Veterinary Surgeons and Veterinary Medical Societies, etc.

ROYAL COLLEGE OF VETERINARY SURGEONS.

THE 53rd Annual General Meeting of the College was held at 10, Red Lion Square, on Wednesday, June 3rd, 1896, Mr. James F. Simpson, President, in the chair.

The PRESIDENT, having remarked that the Council had had a hard year, with plenty of work, and that its members had attended fairly regularly to the duties they had to perform, proceeded to give a personal explanation with reference to the fact that two meetings had been called for that day. A

requisition was sent to him on April 30th to convene a special meeting "To consider the recent action of the Council with regard to the acceptance of educational certificates from students presenting themselves for examination in Scotland." He immediately saw the Solicitor, and ascertained from him the earliest date upon which he could possibly hold a meeting. At the same time he gave instructions to the Secretary to prepare the usual advertisements. The requisition was dated on the 29th April, but no one could act upon a requisition until he had seen it, and he was not aware it had been sent until it had reached his hands. He wanted them to clearly understand that he had not thwarted them in the matter of holding the meeting earlier, which charge had been made against him. It had been said it was competent to hold the special meeting on May 4th, and that it was rather a dishonourable course on his part to allow the meeting to be held after that date. He had a letter from Mr. Thatcher, the Solicitor, confirming his views as to the course taken. The earliest safe day on which to call the meeting was May 26th, but he had the convenience of the whole of the members of the profession to consider, and not merely of those who lived within a stone's throw of the College. What would have been said if he had called a special meeting for that date, and at the same time summoned the members from every part of the kingdom to the annual general meeting on the 3rd June? That was his sole reason for calling the special meeting on the same day as the annual general meeting.

The notice convening the meeting having been read, the minutes of the last annual general meeting were taken as read and confirmed.

Scrutineers' Report.

The PRESIDENT announced that the scrutineers reported that the following gentlemen had been elected to the Council for 1896:—Professor McFadyean, Messrs. Lawson, Elphick, Mulvey, Lambert, Villar, Professor Shave, Messrs. Simpson, Peele, Wartnaby and Captain Butler. The non-elected candidates were Messrs. Almond, Hunting, McCall, Hurndall, Thompson, Clarkson, Hulton and De Jong.

The PRESIDENT said that in the usual course they would proceed to the election of eight members of Council only, but three extra vacancies had occurred in consequence of resignations, and therefore, there would have to be a draw amongst the eleven men elected, as to who should take the place of those who had resigned, viz., Professor McFadyean, Mr. Mulvey and Mr. Hunting.

The draw was then taken, with the result that Mr. Peele took the place of Professor McFadyean, Mr. Mulvey his own place and Mr. Lawson the place of Mr. Hunting. The report of the scrutineers was received and a vote of thanks passed to them.

Annual Report.

The PRESIDENT moved and Mr. WILSON seconded the adoption of the annual report and balance sheet.

Mr. J. A. W. DOLLAR wished to make a remark upon the President's personal explanation at the commencement of the proceedings, but was ruled out of order.

Professor PENBERTHY said that after that ruling, he would enter his protest and leave the meeting. (Laughter.)

Professor Penberthy then withdrew.

Professor MCFADYEAN did not think it was a laughable matter. He had endeavoured to take a perfectly unbiassed view of the situation, and while nothing would be further from his thoughts than to accuse the President of abusing the position of the chair, he thought a slight error of judgment had been made. He suggested that the President should reconsider his decisi on

The PRESIDENT declined to do this, whereupon Professor McFadyean also left the meeting.

Mr. GLOVER was desirous that the Council should reconsider bye-law 113, which had reference to advertisements, and required some sort of undertaking that that would be done.

The PRESIDENT said that arose out of the Report, but it would be convenient to take the matter up after the report had been discussed.

Mr. HURNDALL said he saw no notice in the accounts as to the £100, which was voted to the Institute of Preventive Medicine.

Mr. WRAGG said it was contained under "sundry liabilities."

Mr. HURNDALL thought that was a very careless way of keeping accounts. The £50 granted to the farriers was put down separately, and the same should have been done with regard to the other item.

Mr. WRAGG said he was not responsible for the balance-sheet, excepting to produce the figures to the auditors; the auditors were entirely responsible for it. He would like to make one or two remarks upon the balance-sheet. In 1895, he said, "we withdrew £500 from our account and turned it into consols. At Christmas the profits from the examinations, instead of being £534, as they were in December, 1895, only amounted to £270. That was a state of affairs which neither the Finance Committee, nor the treasurer could know by intuition. In consequence of the falling off of the income we had not money enough to meet our liabilities on the 31st March, and we were obliged to sell out £300 of that £500 of consols. In passing, I may remark that we made a profit of £12 out of the transaction. In consequence of the death of one of the trustees, Mr. Lowe, we were unable to effect the transfer from consols to the banking account, and therefore it has made this balance-sheet look very much worse than it really is. The outstanding cheques, amounting to £624, are for salaries, examination fees, examiners' travelling expenses, and the expenses of the examinations in London and in Scotland. The 'sundry liabilities,' which amount to £372, are for delegates' travelling expenses, rates and taxes, the half-yearly grant to Mr. Coates, printing, stationery. law expenses, coals, the grant to the Institute of Preventive Medicine, and the grant to the Jubilee Memorial Fund."

Mr. HURNDALL: "I must say I do not consider our Treasurer's explanation is at all satisfactory. My question had not reference to where the money had come from. I asked the simple question, Why was it not fully explained that the £100 grant to the Institute of Preventive Medicine was not distinctly set out. I look at it as a piece of carelessness. Mr. Wragg informs us that he did not prepare the accounts, but that the auditors did. That, I think, is a singular reversal of things. So far as I have had any experience in the matter. auditors look over other people's figures, and see if they are correct. How are we to know where our funds go? We do not doubt your honesty and integrity, but we have a perfect right to know what has become of such a large sum as this."

The PRESIDENT pointed out that the report stated "in addition to the grant of £100 to the funds of this society (the Institute of Preventive Medicine) made last year, a sum of about £80 has been contributed for a like object by the various veterinary medical societies."

Mr. HURNDALL, in answer to the PRESIDENT, said he did not want to propose any motion.

Mr. WARD said with regard to the deputation to the Board of Agriculture, he thought that the restoration of the name "Veterinary Department" was most satisfactory, if it carried with it its old characteristics; but if it were merely granted as a policy to satisfy the irritation of agriculturists and the annoyance to which they had been subject, or out of any respect to the profession, he did not think it would be much credit to them. The report

stated that Mr. Cope would be recognised as the Chief Veterinary Inspector. They all knew that since Professor Brown resigned, Mr. Cope had been Chief Veterinary Officer of the Department, and had acted as such, but the wording of the report led them to believe that Mr. Cope had received some special appointment. He should like to know whether Mr. Cope was really the head of the department, or whether they were in the position they always had been, and that gentleman was merely an underling. Certain responsibilities had been thrown upon local veterinary surgeons, and orders had to be carried out by lay inspectors. They knew that that was the failure of the Gardner administration. It was the want of intelligence in scientific knowledge which really caused the evil complained of.

Mr. GLOVER asked for an explanation of the withdrawal of the Veterinary College from the farriers' scheme.

Mr. HUNTING had nothing but good to say of the work done by the Registration Committee, but thought a little more courtesy might have been shown by the committee to those members of the profession who had erred. To a man who had been advertising occasionally for some years it was not pleasant to get a solicitor's letter forbidding him to do so again. The same end might be attained by a letter from the Secretary. It was the same difference as receiving a request for the payment of an account from a tradesman and receiving a solicitor's letter. He recommended that in future the Secretary should write, pointing out that the man's action was against the rules. With regard to another matter, he could not help thinking that there was no more important thing for them to recognise than the position given them by the State. If that were so, the profession was remarkably lethargic. Perhaps what was wanted was an anonymous circular with a few black lines on it to waken them up, and then at any rate there would be 1,200 mostly unheard-of men who would respond at once. He agreed with Mr. Hurndall that there was a good deal to find fault with in the Council's behaviour concerning the British Institute of Preventive Medicine. He thought the amount had not yet been paid.

The PRESIDENT said it had been paid and an acknowledgment had been received from the President, Sir Joseph Lister.

Mr. HUNTING, continuing, said that up to the commencement of that remarkable era of the last three weeks, a great deal of attention had been paid to bursaries and scholarships, but those matters were of little importance compared with education questions. The profession seemed to start a thing in a hurry one day and then forgot all about it. Five or six years ago they had got a medal to commemorate Steel, but they did not hear a word about the Jubilee Memorial to-day. That looked liked being the biggest thing in the way of scholarships ever done by the profession, but it had been swamped for the latest novelty. The Worshipful Company of Farriers, whilst acknowledging the help they derived from the veterinary profession and the Royal Agricultural Society for some years, had arrived at the conclusion that perhaps they had better continue the work off their own bat, and submitted a new scheme which suggested dropping their connection with the Royal College of Veterinary Surgeons and the Royal Agricultural Society. Both bodies, he believed, were aware of it and assented to it. The Farriers now owned their Registration scheme themselves. With regard to the falling off in the funds, he believed that was due to the four years' course, which was more expensive than the three years'. The last examinations showed a remarkable falling oft, but that need not be taken as a criterion of what would happen again. This March examination was an out-of-date examination that would probably not be required again. It was owing to the adoption of a long holiday in between what used to be the winter session, and the curiously ingenious way in which the schools had turned the thirty

weeks into a summer and winter session. What the two long holidays were for he could not tell. There appeared to be a virtue in that summer session as there was in the word Mesopotamia to the old woman. The schools would very soon find out when a young fellow who had been cramming up for an examination had a month's holiday in the middle of it, that he had forgotten six weeks' work, and there would be an increased number of men plucked in future, owing to the crooked attempt to get the summer session in the winter one.

Professor W. O. WILLIAMS: I think it will be a ruination to the schools, and do a great deal of harm if we continue the summer session. Men do not seem to bother themselves; they would far sooner be out rowing or playing cricket instead of sticking to their class. They only put in as many attendances at the class in the summer as will make them efficient and qualify them to go up for their examination. We really give our students forty weeks, whereas we are only bound to give them thirty weeks. Had it not been for what Professor McCall said at the Council, I should have enforced my resolution that we should hold an examination on May 15th, and then the men would have been able to go away, and begin again in October.

Mr. PARR: I notice that the attendances of the members have been given, and I think it would be as well if, in future, the number of times they were summoned was given as well.

Professor MACQUEEN: The report has mentioned the contemplated changes which are about to be made in the Board of Agriculture. I join in the congratulation which, I believe, is pretty general in the profession on those changes; but I am not quite sure if the congratulation should be a congratulation to the Council of the Royal College of Veterinary Surgeons. I notice that no allusion is made to one who, I imagine, has been the prime worker in bringing about the change—I allude to Mr. William Hunting. I venture to say that although the majority of 1,200 voters have not esteemed his efforts in this direction as they might have done, the majority of the members of the profession present in this room will not forget his efforts in their behalf. I believe I am not in order in moving a resolution at this time, but I should not like this meeting to break up without recording our opinion and our belief in Mr. Hunting's efforts. With regard to the Jubilee Memorial, I may say that I took a little interest in promoting it. It went very well for a while, but somehow or other, when the money reached a certain amount, and was about to be put into the coffers of the R.C.V.S., the prospect of carrying out the original intentions of the subscribers became more and more remote. With regard to the Jubilee Memorial, there seems to be a want of decision as to the future. Why? They agreed to accept the subscriptions, and should endeavour to carry out the wishes of the subscribers. The Committee in charge of the Steel Trust, gave orders for a large bronze medal instead of a gold one, which was the understanding upon which the Steel Trust was handed over to the R.C.V.S. I have no fault to find with the result, but the Council should not be too hasty in coming to a decision as to how they shall carry out the wishes of those who subscribe to memorials, scholarships, or anything else. With regard to the grant of the Worshipful Company of Farriers, Mr. Hunting has in recent years endeavoured to belittle the agitation raised against the grant, and the association of the Council with the Farrier's Company, but you will observe that the Council is no longer connected with it; the agitation has resulted in bringing about a separation.

The PRESIDENT, in reply, said: Mr. Hunting has referred to the work of the registration committee. I am sure that nobody knows better than Mr. Hunting what that committee has done. He knows full well that its work has been extremely difficult. He has suggested that the Secretary should write There is really a good deal in what Mr. Hunting has said. The

desire of the committee is to spare the feelings of those who are reported to them as much as possible; and in many instances orders have been given by the committee that the secretary, instead of the solicitor, should write to the offenders. In future, as in the past, the committee will endeavour to give as little pain as possible. Professor Macqueen has alluded to the paragraph in the report which mentions the deputation to the Board of Agriculture. I am only too glad of this second opportunity of saying how indebted I am to Mr. Hunting for the many very valuable suggestions he made to me before I saw Mr. Long upon this very important matter, and I also acknowledge the help I have received from Mr. Kidd, who was also one of the original deputation. I received from those two gentlemen very valuable suggestions which assisted me very much in the somewhat difficult task I had to perform. The request of the Council to me was that I should again wait upon the President of the Board of Agriculture and endeavour to get the restoration of the name. Probably we had in times past gone for that a little too much at once, but it did occur to me that if we could get our name again recognised that at any rate we should have the thin edge of the wedge inserted, and that is really what took place. Now in quoting the words in the report, "That the name 'Veterinary Department' will be restored, and that Mr. Cope will be recognised as chief veterinary officer," the committee have used the exact words used by Mr. Long. I can hardly agree with Mr. Ward that no alterations have been made in our favour beyond getting the name "veterinary department," because I laid very great stress upon the fact when I was with Mr. Long that the lay inspectors did assume duties which ought very properly to belong to the veterinary surgeon; and I gave him an instance that the lay inspector no longer attempts to diagnose disease or to say what should be killed and what should be saved. Mr. Hunting also makes some reference to the importance of State recognition, and I think that we all agree with him. With regard to the Steel Memorial, it was unfortunately found that a medal could hardly be obtained of sufficient size in gold, and it was really after very anxious meetings that the Council at last decided that it should be in bronze. I regret that matters are not sufficiently forward to enable us at this annual meeting to make the presentations of not only the Steel Memorial medal but some announcement to you with regard to the Jubilee Memorial. You will see by the report that the committee hope the tablet will be in position before the date of the annual general meeting. I hope that when I do present this tablet to the College, which I trust will be very shortly—within three weeks time—that it will be a tablet worthy of the acceptance of the profession. Attention has been called to the fact that although the number of attendances at Council and committee meetings are recorded in the report, the number of summonses which members have received does not appear. The suggestion is an admirable one, and I feel sure that it will be unanimously adopted. Some of our committees are standing committees, and limited as to numbers, and of course every member of the Council cannot serve on them. The result is that the attendances of those who have not been elected on those committees come out badly at the end of the year, but the work is pretty evenly distributed. There have been 43 committee meetings and 14 Council meetings held during the year.

Mr. WARD: Is there any difference in the veterinary position with regard to the Department except in the name? The name has been changed, but Mr. Cope is still not head, and we have no veterinary surgeons at the head of the Veterinary Department.

The PRESIDENT: That is quite wrong. For years past we have had a Veterinary Department by name. That is what we have so much cause to complain about. The veterinary profession has not been recognised by the

State by having a department of its own name. That is what I impressed upon Mr. Long, and I have his assurance that that name will be restored, and that Mr. Cope will be recognised as head of the Veterinary Department, and not as Chief Veterinary Officer to the Board of Agriculture.

The report and statement of accounts were then adopted.

Mr. GLOVER wished to draw attention to the operations of the Registration Council, and essentially to the inauguration of the new bye-law dealing with advertisements. He moved, "That this meeting asks the Council to reconsider Bye-law 113." All round they wished to raise the standard of the profession to that of the medical, but in some things they went a little too fast. They had done away with advertising, and now they wanted to do away with forges. He had been threatened to be disbarred if he did not withdraw a mild, inoffensive advertisement which he had from time to time put forward for fifteen years. Advertisements claiming superior attainments were disgraceful; but where a man merely advertised his existence in the same way as medical men had brass plates on their doors, he thought it was premature to prevent him doing so. He had asked the committee whether a mere bold statement of one's existence was allowed, not in the nature of a card, because they were objectionable? The committee said, No. The chairman told him that they had not come to any conclusion upon certain forms of advertising, for they had not been considered. He now asked if any conclusion as to such methods of advertising as having the front of one's house painted from top to bottom with large letters, and putting a great white horse on a red lamp, etc., which he had put before tee committee, had been arrived at?

Mr. WARD seconded the amendment, which was put to the meeting and lost.

On the motion of Professor WILLIAMS, seconded by Col. KETTLE, a vote of thanks was passed to the Chairman, and the business of the Annual Meeting concluded.

At the conclusion of the annual meeting a special general meeting of the members of the college was held for the purpose of "considering the recent action of the Council with regard to the acceptance of educational certificates for students presenting themselves for examination in Scotland." Mr. J F. Simpson presided.

The SECRETARY here read the notice convening the meeting

Mr. HURNDALL asked that the bye-law under which the meeting had been called might be read.

The Solicitor (Mr. GEO. THATCHER) read bye-law 14 as follows: "The President upon receiving a requisition signed by ten members of the Council, or by seventy-five members of the college, requiring him to call a special general meeting of the members, and stating the object for which such meeting is required, shall call such meeting by advertisement within twenty-one days after receipt of such requisition,

Mr. HURNDALL asked for the date when the notice was given to the President.

The SOLICITOR said it was April 30th.

Mr. HURNDALL submitted that the meeting was an illegal one. The meeting had not been called within twenty-one days, and hence they were not in a position to deal with anything connected with the requisition.

The PRESIDENT said that in the bye-law the word "call" was used—the President must call a meeting within twenty-one days of the date of holding of the meeting, and that had been done.

Mr. HURNDALL submitted that the bye-law was wrong, and that the meeting was illegal. He moved that the sense of the meeting should be taken on the point.

Professor McFADYEAN seconded the proposition, which was supported by Professor McFADYEAN and Mr. J. A. W. DOLLAR.

The SOLICITOR said he thought the meeting was in perfect harmony both with the charter and the bye-law under which it was called.

The PRESIDENT then put the resolution, "That in the opinion of those present this meeting is illegal," which was lost.

At the request of Mr. HUNTING, sen., the PRESIDENT stated that the requisitionists were Mr. J. A. W. Dollar, Professor McFadyean, Mr. Mulvey, Professor Shave, Mr. Alex. Lawson, Mr. G. Elphick, Gen. Sir Fredk. Fitz-Wygram, Mr. C. Hartley, Professor J. Penberthy, Professor W. A. Edgar, Mr. T. D. Lambert and Mr. J. Abson.

Professor MACQUEEN moved, "That the object for which this meeting was called being now past, the meeting stand adjourned."

Professor McFADYEAN seconded the motion. He thought it a common-sense view of the situation to take that since the election was now over and the electorate had declared in absolutely unmistakeable terms what was its desire in the matter, there was no further reason why they should sit and discuss a question which had already been discussed *ad nauseam*.

On the motion being put it was lost, 29 voting for and 32 against.

The PRESIDENT then declared the subject of the meeting to be open for discussion.

Mr. HUNTING said that in July, 1892, it was true that the matriculation examination in the profession was made not only like the General Medical Council, but absolutely the same. But their bye-laws got a little mixed, and when they had a letter from Professor Mettam asking the meaning of the bye-laws, as it wanted only three or four days to the Council meeting, and at the time he was President he instructed the Secretary to bring the matter before the Council, which he did. From the report of the proceedings of the Council in October, 1894, it would be seen that a little discussion took place as to the interpretation to be put upon the bye-law. Professor Penberthy said, "I think you will find that the original proposition in my name includes the same conditions as those laid down by the Council." Professor Penberthy did propose a resolution which would in the alteration of the bye-laws have compelled the Council to remain under the rules and regulations of the General Medical Council, but, unfortunately, it was not carried. Then he (Mr. Hunting) as Chairman said, "In the published bye-laws up to the present time we have no clause which says that we shall pass all these subjects at once." That was said by him in a published meeting of the Council, and it had been published in the *Veterinarian*, and in the *Record*, and the Council said no word against it. Professor McFadyean and Mr. Dollar were present at the Council meeting, and offered no explanation or contradiction. By way of marking positively at the time what was the opinion of the Council he endorsed on the back of Professor Mettam's letter the words, "We cannot accept any partial or divided certificate." A few days after that Mr. Rutherford—who probably had heard from Professor Mettam—to make sure in his official capacity as Scotch Secretary, that he should do the right thing, wrote and asked the question "Must men pass their examinations all at one time?' In reply to Mr. Rutherford's letter, he wrote to Mr. Hill as follows: "The Council decided to accept certificates mentioned in our list. If the educational bodies give the certificates, it does not matter to us how they were obtained. I know no published rule of ours saying they must be passed *en bloc*." That he had said at the previous meeting, and he said it now. No such rule existed. The whole of his argument had been "Alter your rules," but the imputation had been that he had been guilty of trickery. What was said about that reply of his? All over the north of England it had gone forth that Mr.

Hunting wrote the reply, and kept it secret because he wanted to give the Scotch schools advantage over the London schools. Politeness alone—common civility alone—prevented his saying the word that should be used in application to that suggestion. Up to January 23rd, 1895, it was a question whether the General Medical Council's bye-laws governed veterinary education or not; but in January, 1895, there was no longer any doubt about the state of the bye-laws. Six months in committee were devoted to putting them right, and the bye-laws were sent to the Council with the following clause in them:—

"Students who enter the veterinary schools shall, prior to their first professional examination by the Royal College of Veterinary Surgeons, produce a certificate that they have passed the preliminary general education examination in force after January 1st, 1892, of the General Medical Council, or produce a certificate recognised by that body to the Secretary of the Royal College of Veterinary Surgeons."

What happened when that came before the Council Meeting? All reference to the General Medical Council was left out, and was left out by Professor McFadyean and Mr. Dollar.

Mr. DOLLAR: I was not a member of the Committee.

Mr. HUNTING: I never said you were a member of the Committee.

The PRESIDENT: This was at a Council Meeting.

Mr. HUNTING: Yes, it was at a Council Meeting when Mr. Dollar was present. I will read you what passed—

"Professor MCFADYEAN: I beg to move that after the word 'surgeons' on the third line, the sentence continues to read, 'produce one of the certificates specified in schedule 1,' omitting all that follows. Mr. Dollar suggests to me that it might read, 'students who enter the veterinary schools shall, prior to their first professional examination by the Royal College of Veterinary Surgeons, produce to the Secretary of the Royal College of Veterinary Surgeons one of the certificates specified in the schedule annexed.'

"Mr. DOLLAR: I will second that.

"Mr. KIDD asked if the schedule might be altered.

"Mr. DOLLAR: The bye-law as altered binds us to follow the General Medical Council.

"Professor MCFADYEAN: No, it does not. It binds us to the first schedule as printed."

But he (Mr. Hunting) had never said one other thing during the whole course of his existence on the Council than what Professor McFadyean and Mr. Dollar said there. From January 23rd, 1895, the Council had ruled that they were governed by the first schedule as printed. Another of Professor McFadyean's followers wanted to show that they were still governed by the schedule and still under the Medical Council, but that was absolute and utter nonsense. Coming to counsel's opinion, it would be seen that in that opinion it was stated that if the bye-laws were not as they wanted them, they must alter them; and it must be one certificate, and not two. That was the view which he (Mr. Hunting) expressed at the October meeting of Council when he saw it must not be a partial or divided certificate. Then it was pointed out that some certificates, even although they knew that the subjects were passed in two or three times, must be accepted because the General Medical Council acknowledged them. Further on counsel stated: "If the examining body allows the qualifying examination to be taken in two parts, the Council must accept the certificate showing a complete pass, although on the face of the certificate it shows that the examination had been allowed to be taken in two parts." The resolution adopted at the special meeting of the Council on December 4th was as follows:—"That in the opinion of this meeting the certificates comprised in the first schedule of bye-law 52 be accepted as a

sufficient educational test, irrespective of the mode in which such certificates are obtained." In other words, the Council there voted that there was nothing in the bye-law, which was now disconnected entirely from the General Medical Council, which said that they should be passed all at one time; and he defied anybody to say to the contrary. Then he came to April 22nd, up to which time not one word had been heard except an occasional remark in the Council about the bye-laws; no suggestion had been made that there was any attempt to reduce the examination. Then Professor Edgar brought forward the following motion: "Students who enter the veterinary schools shall, prior to their first professional examination by the Royal College of Veterinary Surgeons, produce a certificate entitling the holder to be registered as a medical student." That motion would certainly put them again under all the rules of the General Medical Council, and make their examination not only equal, but exactly the same as the General Medical Council. But that could be done by adding a few words to bye-law 52, saying that certificates should be obtained at one sitting. Professor Edgar's motion was never discussed and never disposed of; it was still alive and would come on. It was said that he was treated badly, and that the majority of the Council would not hear it. Nothing of the sort. For electoral purposes it was good enough to say so; and it was good enough to make this little dramatic scene in which Professor McFadyean had shown what he could do, and would do again, whenever he could not get his own way—walk out of the Council! Then Professor McFadyean, by dint of his extraordinary intelligence and high intellectual possessions, had a series of followers, and when he gave the cue and resigned, they said—"I beg to do the same," and "I shall also resign," and "I shall do the same," and "I beg to do the same." If ever there was a man who had a right to stand up and say that he was the victim of misrepresentation, he (Mr. Hunting) was that man.

Mr. J. A. W. DOLLAR said if events had turned out as they had, it had not been because they or their side accused Mr. Hunting of any unworthy or dishonourable motive; it was all because they were firmly convinced that the matter which had been brought before the Council was of really vital importance to the profession, and the profession, after hearing impartially both sides, had decided in their favour. His side had always been in the minority, and during the last two years they had been met with defeat after defeat. They possessed no extraordinary means of appealing to the profession, and they could not claim to have behind them the extensive and high reputation which belonged to Mr. Hunting. He believed that in what he was about to say he truly represented the feelings of every member who had opposed Mr. Hunting, namely, that Mr. Hunting had, to a certain extent, been the victim of a misunderstanding, and that at the worst he had been guilty of inconsistency. Although Mr. Hunting had advanced various ill-defined charges against him, those of which he had given evidence were two. First, Mr. Hunting accused him of misrepresenting his action in regard to the instructions to Mr. Rutherford. He would read the exact words in which the accusation was made, and he appealed to them as men of common sense to decide whether his words did or did not justify the action:—"Mr. Rutherford next wrote asking the same question. The Secretary referred the matter to Mr. Hunting, the then president, informing him, however, that the solicitor was of opinion that no divided certificates would be accepted. In spite of the solicitor's opinion, or the decision of the Council arrived at ten days before refusing divided certificates, Mr. Hunting replied: '*Re* Mettam. The Council decided to accept the certificates mentioned in your list; if the educational bodies give the certificates it does not matter to us how they are obtained. I know no published rule of our saying they must be passed *en bloc*.'" He expressly went out of his way to find an explana-

tion and an excuse for Mr. Hunting. The explanation and excuse were contained in the words: "Mr. Hunting may stand on the literal words used and deny that they convey anything more than the fact. In our opinion they were misleading as written, but they became doubly so when read as an answer to the question—'must the subjects all be passed at one time?'" That was, perhaps, the greatest accusation that had been brought before the members.

Mr. HUNTING: No, no; read about the observation of secrecy.

Mr. DOLLAR said that could only be answered by appealing to the members of the Council present.

Mr. HUNTING said he had shown that in the Council he had, without correction or objection, used every word he put in the letter.

Mr. J. A. W. DOLLAR said that did not explain his letter. Mr Hunting was in possession of the emphatic mandate of the Council, saying that no divided certificate would be accepted. He knew that that was the decision of the Council, and he endorsed it in his own handwriting on the back of the letter to which he (Mr. Dollar) had referred. In the second charge Mr. Hunting said that he (Mr. Dollar) was responsible for the omission of the words "General Medical Council" from the bye-laws quoted. He could only reply to that that he was not a member of the Bye-laws Committee, and that when those bye-laws were brought before the Council for revision it was ruled by the President, in answer to an express question of his, that nothing but verbal alterations would be permitted, and that any alterations suggesting a change in the meaning of the bye-laws would not be allowed. Although at the present time, they who were on the opposite side, must deplore the absence of Mr. Hunting from the Council table, yet they hoped that once he recognised the decision to which the profession at large had come that day they should soon have an opportunity of welcoming him back again amongst them.

The PRESIDENT thought at that stage he should call for a proposition.

Mr. DYER said he begged to move: "That the time has arrived when the profession is quite capable of forming a matriculation examination of its own, and that it be left to the Council to decide what shall be the subjects of such examination, and how they shall be passed." He had not the slightest desire, and he was perfectly certain no member of the present council had the slightest desire, of lowering the matriculation examination. Let it, by all means, be as stiff as the medical; but he did not know that it was material that it should be on the same lines. It would have been better, he thought, if the late Council could have agreed as to the code of the examination. It would have set the matter at rest, and they would not have had that personal quarrel. It was an unfortunate thing that a certain section of the profession were never satisfied with anything.

Mr. ROWE seconded the motion.

Mr. HUNTING said he had framed a resolution which he thought carried out very nearly verbatim the resolutions from the Eastern Counties, the Central, and the North of England Associations. It was as follows:—"That this meeting is of opinion that the standard of general education of the veterinary student should be maintained as at present indicated in bye-law 52 and annexed schedule; and that the Council should, without delay, make the necessary alteration of bye-laws to provide that all subjects should be passed at one examination."

Mr. ABSON seconded the motion.

The PRESIDENT said it was hardly an amendment to Mr. Dyer's motion.

Mr. HUNTING said he did not submit it as an amendment.

Mr. RUTHERFORD said that before the motion was submitted to the meeting the members should be placed in full possession of certain facts. He presumed Mr. Dyer proposed that the examinations should be held by themselves. It

was a sort of counter-blast to the effect that they did acknowledge what was required by the General Medical Council. He thought they ought to know that the examinations recognised by the General Medical Council in England were not for educational purposes recognised by universities and other educational bodies in Scotland. In adopting certificates recognised by the General Medical Council in England, they were adopting certificates which they considered should he easily obtained by freshmen offering to study human medicine; and in adopting such certificates they were adopting those which could be easily got by freshmen who proposed to study veterinary medicine. The point at issue was whether they should adopt a certificate within reach of the ordinary man who went up as a freshman to study veterinary medicine. This opinion was that the certificates were quite within the reach of those gentlemen, that was to say, that it should be compulsory that they should pass all the subjects at one time. In Scotland they went a step farther. The medical schools had two grades of examination—a higher grade and a lower grade. His information from the authorities there was that the lower grade examination was very much higher than what was exacted from the veterinary students, and very much higher than the Medical Council exacted from those who studied medicine; yet although it was a higher certificate they insisted that all the subjects should be passed at one and the same time. There was another examination which was called the higher grade examination, and it being set on a higher standard, they allowed gentlemen to pass as they could—a man came up and passed in three or four subjects and was allowed to come up at a future time and pass in a snbject that he had not before attempted. He was partly in favour of Mr. Dyer's motion—that they should formulate their own examining board. It would not do to have a standard of education which the medical profession of England would recognise as levelling up practitioners to the level of English medical men, while at the same time the English student was not recognised by the medical profession in Scotland.

Professor W. O. WILLIAMS mentioned that within the last two days he had been informed that there was a suggestion by the University Commissioners in Scotland that students should be permitted to pass their preliminary examination in two portions. He should like to know if they were going to follow that course or adhere to the old law of the Medical Council—that the subjects should be all passed at one time.

Professor MCFADYEAN said it struck him as being very funny if that meeting of fifty or sixty members thought it was going to dictate or advise the Council as to what it had to do with reference to the education question.

Mr. HUNTING asked what the meeting was called for.

Professor MCFADYEAN said it was called in order to place the matter on a clear footing. He should have thought it was known to everybody that there were eleven candidates who issued a common electoral address in which they pledged themselves to see that veterinary students were submitted to an educational test identical with that imposed upon medical students. They might sit there and pass ten motions if they liked, but that would not affect the course of the Council except by influencing the electorate at the ensuing election.

Mr. ALMOND said it seemed to him that if Mr. Dyer's resolution were accepted it would be opening up the whole question again. The subject had been before them quite long enough, and he thought that the mandate which had gone forth from the electorate was quite sufficient, and that they should have the matter settled without more ado.

Mr. BARRETT said he was appointed a member of the Council last year and therefore knew nothing of the earlier resolutions of the Council. His actions were based upon bye-law 52 which had been interpreted by him in a certain way and which interpretation he most emphatically adhered to. They were

bound by their bye-laws. If those bye-laws were not what they desired, they must alter them, but they must render them plain and intelligble in order that they may be understood by any student who might desire to enter the profession. Whatever might be said to the contrary, the ambiguous nature of bye-law 52 had led almost entirely to the whole of that educational trouble. He did not desire that the educational standard should be lowered. He thought their standard should be on an equality with that of the medical profession and he should adhere to that, but he did ask that the bye-law should be altered or amended in order that it might be clear and intelligible to all of them.

Mr. DYER said he should withdraw his motion in favour of Mr. Hunting's, which he thought met the whole question.

Professor DEWAR said it seemed to be the general wish of the meeting that the examinations should be uniform with those of the General Medical Council. He wished to point out that, as far as the veterinary profession was concerned, they had not the machinery wherewith to make them exactly the same. As far as Scotland was concerned, he was told that the four universities there appointed a joint examining board, which decided the question of examinations. They, however, could not have a joint examination board. Even if they did appoint a conjoint examining board they could not have an examination uniform with that of the General Medical Council. He declared, without the slightest hesitation, that there were not half a dozen men in the profession who could state what the requirements of the General Medical Council were as regarded the examinations. The thing had not been half discussed.

Mr. HUNTING'S motion was then put to the meeting and carried unanimously.

The PRESIDENT said he had come prepared to meet the very extraordinary charges that had been made against him in *The Veterinarian*, but as he had at the opening of the Council Meeting an opportunity of showing how unjust and untrue was the statement with regard to his conduct in calling that meeting, he scorned to touch the other matters. If they thought him capable of doing that sort of thing he was no longer fit to be their President; but feeling that he had been unjustly accused, he had no hesitation in retaining his seat in the Chair.

Mr. MASON: Our President has been most unjustly attacked; but if we accord him a vote of confidence and thanks, I think that will amply satisfy him.

Mr. KIDD seconded the motion, which was carried by acclamation.

The PRESIDENT: I thank you, gentlemen. That heals many wounds.

The meeting then closed.

The Annual Dinner.

In the evening the more convivial part of the day's proceedings took place in the form of the annual dinner, which was held at the Holborn Restaurant. The chair was taken by the President of the College, Mr. James F. Simpson.

The toast of "the Queen and Royal Family" having been duly honoured, Mr. A. K. LOYD, M.P., proposed the "Navy, Army, and Reserve Forces," and in doing so referred to the invaluable services rendered to the cavalry and yeomanry by the veterinary profession.

Major-General WOOD, in acknowledging the toast, said that the cavalry without veterinary aid would be very helpless indeed, and he knew of no improvement which had made more rapid strides during the last few years than the veterinary art as now practised in the army.

Veterinary-Lieut. MASON also replied.

Sir Henry SIMPSON proposed "The Houses of Parliament," and Sir GEORGE RUSSELL, Bart., and the Right Honble. A. J. MUNDELLA responded.

The toast of the evening, "The Royal College of Veterinary Surgeons," was the next on the list, and in proposing it, Colonel Sir NIGEL KINGSCOTE, K.C.B., referring to the early history of the College, said it was something like fifty-three years ago since its first charter was obtained. Prior to that time there were only two Schools, the London School and the Edinburgh School, which gave licences to people to act as veterinary surgeons, or whatever they liked to call themselves. The most important part of the charter was that whereby the College was called upon to make rules for the examination of candidates, and not to pass them out until they were fit for their profession. Ever since then the profession had gradually grown up until it had become a power in the land. He begged to couple with the toast the name of the President.

Mr. JAMES F. SIMPSON having responded,

The Rt. Hon. A. J. MUNDELLA proposed "The Schools." It had been said, he remarked, that what is put into the School comes out in the life of the nation. Applying that to veterinary surgeons, the work done in their Schools would come out in the life of their profession. There was a time when English people were so much in doubt as to the profession that they were hardly willing to acknowledge it as such; but it was now a matter of rejoicing that the standard had been raised so high that every man who entered the Schools must pass a severe matriculation examination, and to obtain his diploma must have fully mastered the essence of the art he was about to practise. There were forces at their command, every day developing, which tended to make the profession still more scientific and more remarkable in its history and gradual development. He had no doubt that the Rontgen rays would very soon be used by them as an auxiliary. When they considered that through the flocks and herds of the country, as had been intimated by the President, with respect to dairy produce, the health of millions of people was brought within their ken and jurisdiction he hoped that they would do nothing which would in any way detract from the scientific knowledge required of those who entered the profession. In every department of human life the race was more and more swift and the battle stronger: but science conquered everything. He was surprised to hear from the President that nothing had been done by the Government to assist scientific knowledge in the veterinary profession until they obtained the first charter, and then the Act which he had the honour of passing. Now, he was glad to say, they had established themselves and were able to stand alone. The higher the standard was maintained and the higher the requirements of the profession, the higher would it stand in the eyes of the people of the country generally. A very hard time of it they had had for five and a half years when struggling with foot-and-mouth disease and pleuro-pneumonia. A minister who knew nothing at all about it was held responsible for every outbreak from John o' Groats to the Land's End. It was of the utmost importance to the nation that it should have at its command the very highest scientific qualities in those men who dealt with the animal world. The higher the profession stood, the greater the resources at its command, the more humane it was in its treatment of the creatures upon which it had to operate. He rejoiced that the schools were successful and he trusted that the standard of education would be maintained, and that they would do nothing to let it down. There was nothing so dear as bad doctoring whether for the human being or any other creature; and there was nothing so cheap, so good, and so wonderful in the history of the race as the fact that diseases were fast disappearing from the country and that the longevity of the people was steadily increasing. If he might judge from the appearance of the gentlemen he had the honour of dining with that evening, he could almost have wished that he himself had been born into the profession. He had great pleasure in proposing success to the schools: might they long continue to flourish.

Professor MACFADYEAN and Professor DEWAR replied on behalf of their schools, as did also Professor W. O. WILLIAMS, who sounded a note of warning to the profession. He had no doubt that the War Office wanted to do its best to make all regiments efficient, but he had been told that in some yeomanry regiments veterinary surgeons acted as farriers, and he thought the profession ought strongly to object to it. It was a matter that teachers, as well as the Council and those who belonged to cavalry regiments, should take into serious consideration.

The toast of "The Medical Profession" was proposed by Mr. HUNTING, and Mr. TRIGGER proposed "The health of the President."

Mr. F. W. WRAGG proposed "The Visitors," which was responded to by Mr. J. L. WHARTON, M.P., and Mr. WALTER HILLS, the President of the Pharmaceutical Society.

During the evening a selection of music was performed.

THE CENTRAL VETERINARY MEDICAL SOCIETY.

(*Continued from page* 472.)

Mr. S. VILLAR: In common with all of you this evening, I have listened with a very great deal of interest to the speeches that have been made. Several funny and amusing things have been said. I was much struck with a remark which Mr. Edgar made. He said we were here to decide whether the Council or their legal adviser was right. Well now, I take it that does not affect us really. It is for the Council and their solicitor to settle their differences between themselves. We are here as veterinary surgeons and our profession is dear to each one of us—the social standing of our profession likewise; and what we have to decide is whether the status of the preliminary examination which existed from 1892, for several years, should be maintained or levelled down. He must either level up or down. It appears that the regulations in force at the present time are not very explicit. Mr. Barrett is anxious not to disturb the existing regulations but, having listened very attentively I have failed to find that there are any definite regulations in existence. The position seems to me quite a puzzle. Mr. Dollar says that the secretary here in London wrote to Mr. Hunting saying that no divided certificate could be accepted.

Mr. DOLLAR: That was the solicitor's ruling! The secretary wrote to Mr. Hunting what was the solicitor's ruling, namely, that no divided certificate could be accepted.

Mr. HUNTING: We know nothing about the solicitor's ruling. He was never asked his opinion except in private conversation with Mr. Hill.

Mr. DOLLAR: I quote Mr. Thatcher.

Mr. HUNTING: I distinctly assert that he was never asked except by Mr. Hill privately.

Mr. BARRETT: Mr. Thatcher was so undecided that he was the first to seek counsel's opinion.

Mr. DOLLAR: You are mixing up quite two distinct periods.

Mr. VILLAR: It appears to me that the secretary in London has shewn by his own letter, written two years ago, that only undivided certificates would be accepted. Subsequently he telegraphed to the Scotch secretary that he was to do just as he liked in the matter, or as he had done before. I say that is wrong. We are one profession. We must have a level and the question is what shall that level be. Are you going to level down or to adhere to the rule passed in 1892? Education the world over is advancing. Are we to go back? For my own part I say "No, decidedly not!" Hence I have very great pleasure in supporting Mr Dollar's resolution.

Mr. HUNTING: May I refer to counsel's opinion?

The CHAIRMAN: Anything in explanation of what has been said.

Mr. HUNTING: Mr. Morton Smith, upon a case stated, gave his opinion as follows:—"The Council can only act as provided by the bye-laws; and if the provisions of the bye-laws seem to work injuriously, the only remedy is to alter them, but until they are altered they must be followed strictly. Bye-law 52 and the first "schedule" must be read together. The use of the plural 'certificates,' in bye-law 52, does not affect the question raised in the case, because it is "one of the certificates specified," etc., that is to be produced. In order to decide the point raised, the schedule must be examined, and I consider that after such an examination the true answer to the question put is as follows: (1) That in all cases where a certificate is mentioned it means a certificate complete in itself, and which must include all the subjects specified in reference to such certificate." Now, the word "specified" means the subjects specified by the educational body giving a certificate. ("No.") If it does not it means nothing, as we have not specified the subjects which we require.

Professor MACQUEEN: May I ask what is before the meeting? I have been in this room nearly an hour and I have not heard anything of any great importance. Can you oblige me by saying what is really at issue? What is Mr. Dollar's resolution?

The CHAIRMAN read the resolution and said that a similar resolution had been passed by the Midland Counties Association and by the North of England Association.

Professor MACQUEEN: I have gathered sufficient information, even though it is of a mixed kind, from what has transpired since I entered the room. I object, and should have objected most strongly at the very inception of this discussion to this Society entering upon any question of the kind because it has been the rule in this Society from its earliest days to discourage political manœuvres, and I maintain that this resolution of Mr. Dollar's is an electioneering dodge. ("No.") We have no right to pledge ourselves to support candidates who are determined upon a higher basis of education. And if the question had been separated from the superfluity, from the certainly meandering parts which had been allowed to creep upon it, it is quite likely that the question would have been rejected by a direct negative. But, coming to another view of the matter, I object, as a member of the Central Society, to the time of this meeting being occupied with a debate which is devoted to a sort of washing of the dirty linen of the Council of the Royal College of Veterinary Surgeons. We are not here to put them right. It is not for us, it is not our purpose, to say whether we should have a higher standard, whether the subjects should be passed at one time, and whether, failing that, the profession will be debased by the acceptance of a divided certificate. That is not our purpose. I deny that it is the province of this meeting to discuss anything of the kind brought up in that compound method which the wording of this resolution suggests. Had the resolution been limited to the mere issue: "Shall the Central Veterinary Medical Society" support higher education, or lower education, or medium education, then I should certainly have joined in the debate and given what assistance I could. But when three separate items are tacked together, it is very easy for anyone to see what is at the bottom of the whole thing. I believe in education. I believe in the proper importance of education, whether at the inception of a professional career or at its conclusion. But I do not believe in the imposition of the higher standards of education without due notice, and that has not been given. That has not been given in the case at issue. You may say that is because the registers of the Royal College of Veterinary Surgeons have contained the schedule for years. (Mr. Dollar: And the minutes of the Society.) And the minutes of the Society may have

contained the same. I admit all that. But what is that is stronger than all your efforts; the mere fact that within the past two years misunderstandings have crept in, and those misunderstandings have originated with your own officials. Tell me why misunderstandings have arisen with regard to the imposition of your own examination, if everything was so clear and free from error. Everybody confesses, and I have heard our friend, Mr. Dollar, himself confess—perhaps when he was not on the carpet—that the bye-laws of the Royal College of Veterinary Surgeons were a "maze." What was our friend's first duty when he entered the Council? Was it not to set himself boldly to amend those bye-laws? A great many have tried their hands at it, and a great many others will try it again. To return to the question, if there be a question, I do not believe that there is anything more than a mere technical advantage to be gained from an undivided certificate, because we do not know—nobody knows, nobody ever gets behind the certificate—we do not know whether the man who holds the undivided certificate has tried once or twenty times to obtain it; and we know just as much how many times the man has tried to obtain what is called the divided certificate. Let us glance for a moment at some other departments of life, and leave education for awhile. Take wealth. Does any man object to wealth because he receives it in bits? Does the millionaire become a millionaire at once? Is he not content with a few thousands at a time? Take happiness. Can a man buy it? Can he simply obtain it at once and when he will? He certainly cannot. Take food, take anything you like, you will find it can only be obtained and used wisely if acquired by degrees. So much for education. Education, I do not believe, stands upon any different line, and if the whole object be to interest the outside, non-professional opinion in the veterinary professional world, you will find you will interest outsiders by your behaviour after you get a diploma far more than by your behaviour before you get it. It is simply mistaking the meaning, the intention, and the sense of the public. My own idea regarding this question is this: that the man who is so strongly in favour of a single certificate, showing a high matriculation standard, is pinning his faith to something which has no very serious existence. I maintain that apart from education altogether—and, mind you, there are some very strong facts to be quoted in this connection—there would have been and there will be what may be called great men. I do not believe that education controls the rise of ability in any walk of life or in any profession. And if you take your own profession and go back to its foundation, I defy you to give me the example of one highly-learned man.

Professor McFadyean: Professor Macqueen began his speech by saying that he had been in the room an hour and had hardly heard anything worth listening to. I am not quite sure that his own contribution to the debate is of a very solid character. I tried to pick up the thread of his argument as he went along, and I could not detect it. It struck me that he rather insulted this audience in pitching his speech in the tone he did. Does he seriously mean to tell us that the question of what standard of education is championed by the Royal College of Veterinary Surgeons is not a question which interests this Society. As has been already intimated by previous speakers, I intend, if I can get anybody to nominate me, to stand for re-election to the Council. I am not ashamed to come before this Society and ask the members to support me, and I am delighted to have the opportunity of stating clearly the issue upon which I desire to stand. (Mr. Hunting: One issue.) One issue! That is the point. I am quite prepared to resign again on any other question of equal importance. I only wish you (Mr. Hunting) had the same courage. If you had, the chances are you would find yourself out in the cold.

Mr. Hunting: After that challenge I will resign.

Professor McFadyean: It will add a new zest to the coming election if Mr. Hunting will resign and issue an election address in harmony with his actions at the Council during the last six months. That is the only stipulation I would make. Those of us who have been in favour not of altering our regulations or of raising the educational standard, have had at the Council board two classes of opponents. On the one hand we have got one or two men who are honest enough to say that they desire to see the educational standard lowered, first on the ground that education is wasted on a veterinary student, and secondly that it is ridiculous to maintain that a student of veterinary medicine requires to be as well educated as a student of human medicine. These straightforward members of the Council have another argument, that is, that the imposition of a higher test is going so to cut down the number of entries that the veterinary schools will cease to be remunerative institutions. Now, that is a perfectly straightforward, honest issue, to place before the profession; but I am not going to insult this meeting by entering into a refutation of these arguments. It would astonish me beyond measure if any member of this Society would get up and seriously maintain that to demand one of the educational certificates specified in our list is too severe in the sense that the student who possesses such certificate would have in him the making of a better veterinary surgeon if he had been more ignorant in matters of general education. That is really another way of stating the argument. And with regard to the fear (for it is not an accomplished fact), that the test introduced a few years ago will so reduce the number of veterinary students that the schools will be unable to exist, with regard to that I will only say that it is rather too soon to begin to pluck up our recent bye-laws on account of this fear. I do not suppose that there is the slightest doubt that the higher test will make the number of veterinary students smaller than they would have been if he adhered to the late ridiculously low test. On the other hand I have not the least fear that with the high test we can get quite enough students to keep the veterinary schools in existence, and more than enough to compensate for the natural waste of the register through death and other causes. But there is another class of opponents whom we have had to meet at the council board. There are those who tell us they are in favour of maintaining the higher educational standard, but they hedge it about with a large number of limitations, and when the matter comes to a vote, they are always found on the side of those who openly avow a reactionary policy. These are the men who here and elsewhere rise and try to drag red herrings across the scent. One of these—a common one—is that they would like to see the standard of education maintained, but they want us to devise an examination of our own, on the ground that it is surrendering our dignity to insist on a test of the same value as that imposed upon the student of human medicine. Now, I say that is an argument one could understand being introduced if this was an assemby of children. In the name of common sense, if we want to have our educational standard fixed, and we want to have it the same as medicine, why should we not do the sensible thing we have done and just say we will adopt the standard they have adopted. About this question there is a tremendous amount of ignorance, and I have gradually observed that some of the greatest authorities at the council board are the most successful in mystifying their fellow members. I think it is very likely that those who have not paid any special attention to the matter and looked up the regulations of the General Medical Council are under the impression that the General Medical Council conduct an examination. They do nothing of the kind. A few years ago they had to do what we do now—ascertain the minimum test they would demand from medical students. They passed a resolution defining what that minimum should be, and drew up a list of exam-

ining bodies whose examinations appeared to conform with their requirements. But they exercise no control over these examinations. They have nothing to do with them. They have no control over them. These examinations belong quite as much to us as to the Medical Council. (Mr. HUNTING: Don't they fix the subjects? We have not). Will you allow me to proceed? You have had a fair innings, and I am coming by-and-bye to your portion of the evening's entertainment. I say how, in the name of common sense, are we surrendering our dignity if, wishing to have the same standard as the medical profession, we accept just the same certificates? The examining bodies do not examine specially for the Medical Council. There is a list of 50 or 60 examining bodies. The Medical Council made a selection from those, and it has now every respectable examining body in the kingdom. The truth is that this is simply a fallacious argument, introduced to confuse the issue. One cannot understand it in the mouth of anybody who wants us to have a standard equal to that of medicine. I can quite understand anyone wanting us to have a lower standard, saying "we will not have the same, let us have one of our own," and then such persons will try to get a different standard, one in fact, if not in name, lower than the medical. I can also understand a man who wants a higher standard saying "we will have another." But if we want the same standard why should we not accept the same examining bodies as the General Medical Council. As I said a minute ago, I am desirous of standing for the Council of the Royal College of Veterinary Surgeons on this one issue, which is not a matter of no importance. Mr. Hunting is very seldom taken seriously on this matter, and I think he is anxious that we should all suppose that the matter is one of no importance, that we are making a fuss about nothing, and that the matter will come right. It will not come right unless we take steps to arouse the profession on the subject. Recent events at the council board have shown that there is a distinct majority of members on it who are anxious to pull the educational standard down. ("No." "Nonsense.") Oh, it is no nonsense. Unless some of those who stand for the Council this time are replaced by men who have pledged themselves to maintain the educational standard that standard will be lowered. ("No.") There are two ways of estimating how a man will act in the future. First there is his profession of belief, and secondly, there is how he has behaved in the past. Now in reference to the matters upon which Mr. Hunting,—

The CHAIRMAN: I am very sorry to interrupt, but according to our bye-laws the time of meeting has expired. It is, of course, for the members to say whether this debate shall proceed further.

Mr. HUNTING: I beg to propose that the meeting be prolonged,

Mr. SAMSON seconded the motion.

Professor MCFADYEAN: If anybody likes to propose that the vote be now taken I am perfectly agreeable.

Professor MACQUEEN proposed this as an amendment, adding that, taking of the vote now would make no difference to Professor McFadyean as he was going to be re-elected on the Council anyhow.

The amendment having been seconded, the original motion to continue the discussion was adopted.

Professor MCFADYEAN: My suggestion that the debate should cease if it were the wish of the meeting, arose from no fear that I should not be able to make out a good case against Mr. Hunting. The determination to proceed, however, will necessitate my indulging to some extent in a repetition of the facts which were admirably set forth by Mr. Dollar. I must, like Mr. Dollar, go back to the very beginning of this question. It was at the quarterly meeting of the Council, held in October, 1894, that the question was first raised as to whether divided certificates could be accepted. Now there need

be no quibble as to what a divided certificate is. It means more certificates than one, and it means, in substance, that the gentleman presenting it did not pass all the subjects inscribed on those certificates at one and the same time. The Council, without dissent, instructed their secretary to inform Mr. Mettam that divided certificates could not be accepted. Within a fortnight afterwards, Mr. Mettam thought he would try again, and, as the result proved, he was justified in twice attempting to extract an affirmative answer instead of a negative one. But his second application was not submitted to the Council but to the President for the time being, Mr. Hunting, and in forwarding this letter to Mr. Hunting Mr. Hill, the Secretary of the College, wrote: "With regard to Mr. Mettam's enquiry as to whether the educational examination can be passed piece-meal, I asked the solicitor his reading of the rule, and he is of opinion it must be at one examination. . . . I propose, therefore. to write to Mr. Mettam, informing him that the examinations must be passed at one and the same time in all subjects, *i.e.*, *en bloc*." Mr. Hunting's reply to this was read by Mr. Dollar. Mr. Hunting wrote: "I know no published rule of ours saying they must be passed *en bloc*." It was quite evident he did not know. I never suggested that he did know of any bye-law, but there was a bye-law in existence for all that. On the 21st of July, 1892, a resolution was passed to the effect that, after the 7th of September, 1893, the Royal College of Veterinary Surgeons would not accept a certificate that was not acceptable to the General Medical Council. That was passed and, within the statutory period, it was confirmed, and it therefore became a bye-law, and it was in existence and in force at the time when Mr. Hunting wrote to Mr. Hill that he knew of no published bye-law to the effect that all subjects should be passed at once. Well, clearly, if the bye-law said—as it did—that the certificate must be acceptable to the Medical Council, the whole question turned upon this: Would the Medical Council accept divided certificates? That was a point debated at great length, on which Mr. Barrett misled the Council of the College. He rose and said that the Medical Council would accept divided certificates.

Mr. BARRETT: I said they ought to.

Professor MCFADYEAN: You didn't say that; you said they would. Mr. Hunting, in the next issue of *The Veierinary Record*, quoted Mr. Barrett as a great legal authority. In private conversation afterwards. I begged and implored Mr. Barrett and Mr. Hunting to get the question settled, and I made the natural suggestion that they should go to the office of the General Medical Council in Oxford Street, and ask the Registrar there whether that Council accepted divided certificates. Wild horses would not, however, drag either Mr. Hunting or Mr. Barrett to the office of the Medical Council. (Mr. HUNTING: I am not responsible for what Mr. Barrett said.) You hear that! Did their failure to go the office of the Medical Council look as if they were anxious to find out the trnth? (Mr. HUNTING: I knew it.) That will give you a notion whether Mr. Hunting made a mistake. On ihe 16th of October, 1894, Mr. Hunting gave instructions to Mr. Hill that he should write to Mr. Rutherford a reply which was in substance to the effect that divided certificates were acceptable to us.

Mr. HUNTING: I object entirely to that interpretation. Use my words, please.

Professor MCFADYEAN: Now, look here, you have had a pretty fair innings. If I am misrepresenting you I am discrediting myself. I will take the risk. For more than six months a few of us on the Council maintained, in spite of Mr. Barrett and Mr. Hunting, that the General Medical Council did not accept divided certificates. Mr. Barrett said that as the Medical Council accepted divided certificates, by insisting upon undivided certificates, we should be requiring a higher qualification for veterinary than was required for medical students.

Mr. BARRETT: I never said that. You entirely misquote me.

Professor MCFADYEAN: You took upon yourself to interpret to the readers of *The Veterinary Record* the effect of my motion on this matter.

Mr. BARRETT: That is a different thing.

Professor MCFADYEAN: You said it would have the effect of requiring a higher test than was required for medicine. You said it was not necessary that all subjects should be passed at once.

Mr. BARRETT: I say so now.

Professor MCFADYEAN: But no other living human being, who considers the matter well, will say the same. The regulations of the Medical Council are as plainly set out as anything can be, and they required all the subjects to be passed at one and the same time. I could not induce Mr. Hunting or Mr. Barrett to go to the office of the General Medical Council, but I was fortunate enough to persuade the President of the College Council, Mr. Simpson, to go, and he was good enough to allow me to accompany him. The substance of our conversation with the Registrar was that we had been informed at the Council of the College that the Medical Council did not insist upon all the subjects being passed at one and the same time. The Registrar interrupted me with the simple statement, "It is not true."

Mr. HUNTING: Was it not true at one time?

Professor MCFADYEAN: Not true since the date specified, the 1st of January, 1892. That day was put in so that we might have an education test the same as that required for medicine.

Mr. HUNTING: Then it was unfortunately omitted from the bye-laws.

Professor MCFADYEAN: What has that to do with it?

Mr. HUNTING: Oh, we are bound by the bye-laws.

Professor MCFADYEAN: I put it to you, if in the register for 1894, it was stated that this bye-law had been passed, although it was not numbered as a bye-law, had it not all the force of a bye-law, and did not Mr. Hunting know it was in existence? He admits that he did. To come to another point: Mr. Hunting said at a particular meeting of the Council in December last, that I moved a resolution to the effect that a previous resolution passed by the Council was contrary to the bye-laws. I never did anything of the kind. The Council on that occasion passed a perfectly colourless resolution to the effect that if students produce certain certificates, it did not matter how they got them. No sooner had the Council passed that resolution than Mr. Simpson drafted a telegram to be sent to Mr. Rutherford, telling him to "accept certificates as before." The whole question turns upon what sort of certificates had Mr. Rutherford accepted before. Unfortunately, there is no doubt about that, because there is, in the archives of this institution (the Royal College of Veterinary Surgeons) a letter from Mr. Rutherford, which the President read that very day, stating that during the last session he was in the habit of accepting divided certificates. If a student presented a certificate short of one subject he (Mr. Rutherford) allowed him to come up and present another certificate with the subject missing. At that time we were governed absolutely by the rules of the General Medical Council. As to the change made in our bye laws when the bye-laws were revised a year and a half ago, it was thought that a better method than that of simply stating that students must produce a certificate acceptable to the General Medical Council, would be to give the list of certificates acceptable to that Council. We did away with that bye-law which said that the student must produce a certificate acceptable to the General Medical Council, and went to the regulations of the Medical Council and copied the list of certificates acceptable to them; and although Mr. Barrett was under the notion that the medical schools and the hospitals had the power of imposing a medical test——

Mr. BARRETT: I never said anything of the sort.

Mr. DOLLAR: I can bear witness to the fact that you did.

Professor MCFADYEAN: Fortunately, I have a witness in this case, and his assertion tends to discredit some of your previous denials.

Mr. BARRETT: You are misquoting me, but not intentionally.

Professor MCFADYEAN: We copied into our bye-laws precisely the same list of examinations as were acceptable to the General Medical Council, and this in order to keep up the standard of education. There are men on the Council, however, anxious to pull that standard down, and they twisted the sense of Bye-law 52. That bye-law says the student must produce one of the certificates mentioned in the annexed schedule, but they turned round and said, "We will take a divided certificate." They did that in spite of the opposition of the Solicitor of the College. The President of the College (Mr. Hunting) was anxious to get the Council to direct that divided certificates be accepted. He got the Solicitor to advise him, but he would not advise him that divided certificates could be accepted. Then Mr. Hunting posed as a great authority on law, and Mr. Barrett posed as a great authority on law, and in spite of the opinion of the Solicitor to the College, the Council decided to be guided by the quack legal advice of Mr. Hunting and Mr. Barrett. There are some other points which have been absolutely misrepresented, but I feel ashamed of the time I have already occupied in addressing you. I simply thank you, before I sit down, for the indulgence you have shown me, and I beg you to believe that this is not a trifling question. I solicit the vote of everyone who thinks it is important to maintain an educational standard.

Mr. HUNTING: I will not waste a minute. I wish to say a word in explanation. Here is the 1894 Register. I did not give quack legal advice. Of course I accept that phrase in a Pickwickian sense. I, unfortunately, was acting officially, and had to be careful what I was writing about.

Professor MCFADYEAN: In what sense officially?

Mr. HUNTING: As President.

Professor MCFADYEAN: You were not President at the time you gave this advice. It was only in November last.

Mr. HUNTING: I am simply referring to my letter.

Professor MCFADYEAN: If you insist upon making a speech I shall want to reply.

Mr. HUNTING (referring to the Register of 1894, the year of his presidency), defied anyone to find in that book from page 53 to 80 any rule or bye-law referring to the General Medical Council.

Professor MCFADYEAN: I submit that this is not an explanation.

Mr. HUNTING said that by writing the letter in 1894 he had been accused of causing all the mischief.

Mr. DOLLAR: I merely confined myself to facts and left it to others to draw their inferences.

Professor MACQUEEN: I wish to propose that this discussion be postponed to the next meeting.

Professor ALMOND: I think the subject has been fully discussed, and that we have the necessary matter before us to enable us to decide the question to-night. I think it would be a pity to defer coming to a decision. Professor Macqueen, who previously said that the subject should not be discussed, now proposes that its consideration shall be adjourned. I do not think there is much consistency about that. It seems to me that the matter is put clearly by the bye-law 52, which states distinctly that one of the following certificates (which are mentioned) must be produced. We have also to assist us in our decision the opinion of counsel, obtained by our solicitor, who supports the bye-law as it stands. Solicitor and counsel are agreed that divided certificates cannot be received. I think we are all agreed that there is really only one standard which can be taken for the study of medicine. The subjects we

have to consider are identical with those of human practitioners, and it seems to me that the whole body of the profession are unanimous that we should have the same standard. Medicine is divided into two branches, of which we, as veterinary surgeons, represent one. We do not need any higher education, but simply the educational test as it stands in the bye-laws. There is no need of any alteration. I think the introduction of the word "higher" before standard might lead to misapprehension.

Mr. DOLLAR deleted the word "higher" from his resolution, which then stood:—"That in the opinion of the Central Veterinary Medical Society the standard of preliminary examination should be maintained, and that all subjects be passed at one sitting as in the medical profession, and we pledge ourselves to support only those candidates who are prepared to vote in accordance with this view."

Professor MACQUEEN: I propose an amendment. I think we are entitled to consider an amendment to this proposition. I beg to propose as an amendment: "That this meeting expresses no opinion upon this question in the present state of knowledge of the proceedings of the Council of the Royal College of Veterinary Surgeons." As a member of this Society, I do not commit myself to the statement whether I agree or differ, and in the present state of knowledge of the proceedings of the Royal College of Veterinary Surgeons, I invite the members of this Society not to commit themselves to the resolution.

Mr. BARRETT: I rise to second the amendment, and I should do so because I think, with Professor Macqueen, that this meeting is not in possession of sufficient knowledge to vote on a question of this magnitude. (Mr. DOLLAR: You said just now that it was not a question of any magnitude.) I should be sorry if you came to a hasty decision upon this matter.

Mr. DOWELL supported the amendment, and added that he was sorry he arrived late, as he was desirous of bringing under the notice of members of the Society a rather curious pathological specimen he had come across in the shape of a singing mouse—a common garden or wild mouse—which he then submitted for their inspection.

For the amendment there were eight votes, and for the original motion, 22. The latter was accordingly declared carried.

At the instance of Mr. DOLLAR, a hearty vote of thanks was accorded the chairman, and with this the meeting ended.

BOMBAY VETERINARY COLLEGE.

PROFESSIONAL examinations of the Bombay Veterinary College, for 1896, were conducted by a Board of Examiners composed of the following gentlemen:—President, Veterinary Lieutenant-Colonel W. S. Adams, Inspecting Veterinary Officer, Bombay Army; Members, Veterinary-Captain J. W. A. Morgan, Superintendent, Civil Veterinary Department, Bombay Presidency; Veterinary Captain H. T. Pease, Assistant to the Inspector-General, Civil Veterinary Department; Dr. M. G. Deshmukh, M.D., B.Sc., B.A.; Mr. N. D. Dhakmarvala, G.B.V.C., Lecturer on Anatomy, Bombay Veterinary College; Mr. V. E. Vakharia, G.B.V.C., Lecturer on Chemistry, Bombay Veterinary College; Secretary, Veterinary-Major James Mills, A.V.D., Principal, Bombay Veterinary College. The Board commenced their work on 20th April, 1896, and examined 54 students. Out of 15 students who presented themselves for the Third Professional Examination, nine passed; out of 20, nine passed in the Second Professional Examination; and out of 19, 14 passed in the First Professional Examination. The following is the list of students who passed the different examinations:—

Third Professional (*Diploma*) *Examination*:—First Class, H. A. R. Foy, A. M. I. Shaikh, and S. E. Benjamin. Second Class, E. T. Hoole, L. C. Buckel, W. R. Mudliar, R. J. Gosla, P. S. Munshi, and S. R. Jalihal.

Second Professional Examination:—First Class, A. N. Patadia. Second Class, E. H. Brand, A. J. Ansari, R. W. Simpson, M. C. Joshi, A. R. Duberia, and J. Conroy. Pass Class, Abdul Rahiman and C. G. Metha.

First Professional Examination:—First Class, H. V. Kulkarni. Second Class, S. V. Karandikar, R. M. Mudliar, D. S. Purohit, R. E. Daver, J. M. C. Rebello, F. E. Rodrigues, V. R. Khadape, F. X. Mascaranhes, T. J. Walke, D. K. Gosla, and V. G. Sathe. Pass Class, R. M. Pandya and G. G. Phatak.

The following is a list of prizes that were awarded:—(1) Veterinary-Lieutenant-Colonel W. S. Adams's prize of Rs. 20 in books and instruments for the best student at the Third Professional Examination was awarded to A. M. I. Shaikh; (2) M. R. Railway Man Mull silver medal for the best Hindoo student at the Third Professional Examination was awarded to W. R. Mudliar; (3) Veterinary-Major J. Mills's prize of Rs. 30 in books and instruments for the best student in Operative Surgery was awarded to A. M. I. Shaikh; (4) Government silver medal for the best student in Soundness and Age of Horses was awarded to C. L. Buckle; (5) Veterinary-Captain J. W. A. Morgan's prize of Rs. 32 in books and instruments for the best student in Obstetrics and Breeding, Hygiene and Sanitary Science was awarded to H. A. R. Foy; (6) Veterinary-Major J. Mills's prize of Rs. 25 in shoeing tools for the best student in shoeing was awarded to S. E. Benjamin; (7) Sir D. M. Petit's prize of Rs. 20 in books and instruments for the best student in Medicine and Surgery at the Second Professional Examination was awarded to A. N. Patadia; (8) Sir D. M. Petit's prize of Rs. 20 in books and instruments for the best student in Anatomy and Physiology at the Second Professional Examination was awarded to A. N. Patadia; (9) "Steel" memorial silver medal for the best student in the Handling of Animals (1st prize) was awarded to J. T. Walke; Veterinary-Lieutenant-Colonel W. S. Adams's prize of Rs. 20 in books and instruments for the best student in the Handling of Animals (2nd prize) was awarded to R. M. Mudliar; (11) Sir D. M. Petit's prize of Rs. 20 in books and instruments for the best student in Anatomy and Physiology at the First Professional Examination was awarded to R. E. Daver; (12) Dr. M. G. Deshmukh's prize of Rs. 15 in books and instruments for the best student in Chemistry and Botany was awarded to H. V. Kulkarni; (13) Mr. N. D, Dhakmarvala's prize of Rs. 10 in books and instruments for best attendance was awarded to Simpson and Daver.

On Thursday, 30th April, the diplomas and prizes were distributed to the successful candidates by Veterinary-Lieutenant-Colonel W. S. ADAMS, President of the Board of Examiners, who, in the course of a lengthy address to the students, said that he congratulated those young men who obtained their diplomas, and warned them that though they had completed their curriculum at College they were not to consider themselves by any means perfect. They should always consider themselves students, because there was something to learn every day in their profession, and advised them to take careful notes of cases, and to observe the various phases and symptoms presented by the cases which came to their notice, and to compare one case with another, which was the only way for them to become sound practical men. He also warned the students who had to continue their studies at the College to give every attention to the practical part of their training, as it was the only true road towards the end they had in view, viz., to obtain the diploma of Graduates of the Bombay Veterinary College.

Veterinary-Major MILLS then thanked the President and members of the Board for their kindness to the students, and hoped they had enjoyed a pleasant outing.

CONTAGIOUS DISEASES ANIMALS ACT, 1894.

Summary of Returns of Outbreaks, for the four weeks ending June 20th, 1896.

England and Wales.

Pleuro-Pneumonia.	Swine Fever.	Glanders including Farcy.	Rabies.	Anthrax.	——
None	Outbreaks confirmed 547 Swine, Slaughtered, diseased, or exposed to infection 7,587	Outbreaks confirmed 59 Animals reported during the four weeks as attacked 72	Cases in dogs reported 36 Other animals ... 2 Destroyed, as having been exposed to infection 11	Outbreaks reported 20 Animals attacked 40	

Scotland.

None	Outbreaks confirmed 7 Swine, slaughtered, diseased, etc. 391	Outbreak reported 1 Animal attacked 1	Outbreak reported 1 Animal attacked 1	Outbreaks reported 8 Animals attacked 14	

Ireland.

Summary of Returns for week ending 30th May, 1896.

None	Outbreaks confirmed 20 Swine, slaughtered as diseased, etc. 60	None	Cases in dogs reported 8 Other animals 6 Animals Destroyed, etc. 11	None	

Sir Dennis Fitzpatrick presided at the annual distribution of prizes at the Lahore Veterinary College, and spoke of the impending relinquishing of the Principalship by Veterinary-Captain Nunn as a loss to the Province. Veterinary-Captain Nunn reverts to military service next cold weather, and goes home at the opening of the trooping season, It has been definitely settled that his successor in the Principalship will be Veterinary-Captain Pease.

SOME PROBLEMS IN TILLAGE.

BY H. R. HILTON, TOPEKA.

"PLANTS, like animals, need food, and, like animals, do best on a balanced ration.

A Balanced Ration.

"The essential elements of this balanced ration obtained from the soil are nitrogen, potash, phosphorus, lime, magnesia, iron, and sulphur. If one of these is absent from the soil, or not in available form, the plant will be defective. If either nitrogen, potash, phosphorus or lime is absent the plant will be short-lived. All of these elements are needed, and if one be missing that one controls the life of the plant.

The Four Soil Workmen.

"Assuming that all food elements required are present in sufficient supply, four important agents must still co-operate before the seed can germinate and the plant partake of the foods provided. These are heat, air, water, and light. If there is a deficiency or excess of either one of this quartet plant life suffers; if all are present in right proportions the plant reaches its highest perfection.

Plant Requirements.

"Each plant has its own requirement of heat, air, and water; but when a fine-textured soil has a temperature of 75 to 90 degrees F., and contains 20 to 30 per cent. of its bulk of water, or 16 to 20 pounds of water to each 100 pounds of soil, and the air can permeate freely, it is in the most favourable conditions for the growth of our ordinary field crops. This would mean a temperature about equal to the summer of 1895 in eastern Kansas, with a supply of water in the soil equal to three inches constantly maintained for every foot in depth of soil. It would also mean a soil in good physical condition, that the air may co-operate with the heat and water.

Nitrogen.

"Nitrogen, a product of decaying animal and vegetable matter in the soil, is the most costly, the most easily wasted or lost from the soil, and the most valuable to the plant itself of all the food elements obtained from the soil. Its sufficiency has an important bearing, not only on the processes of building the plant structure and formation of the seed, but also on the soil conditions that favour the retention of moisture and the preparation of the other food elements for the use of the plants.

Micro-Organisms.

"Organic matter (that is, animal and vegetable matter) in its various processes of decomposition in the soil is called humus. The products of this decomposition are ammonia, carbonic acid, and water. The agencies in this work are micro-organisms in the soil. The ammonia is converted by other micro-organisms into nitrous and nitric acid. The carbonic acid acts on the mineral elements of the soil and aids in rendering them more soluble and available to the plant.

"The work of these lower organisms is important. German and French investigators have found from 500,000 to 900,000 germs in a gram of soil (less than half a cubic inch).

"These micro-organisms can only exist where organic matter is present and will be many or few as organic matter is abundant or scarce. They are dormant when the temperature of the soil is below 39 degrees F. or above 115 degrees F.; dormant when the moisture content of the soil falls below 8

to 10 per cent., or about one inch in depth of water to one foot in depth of soil; dormant when the soil is fully saturated with water, and dormant when air is excluded either by two much water in the soil or by soil compaction. They are most active when the soil is about half saturated; that is from 20 to 30 per cent. of the bulk of the soil, or, say, 16 to 20 pounds of water to each cubic foot of soil, and when the temperature of the soil is 75 to 90 degrees F., and the air has free access to supply oxygen.

A Live Soil.

"When air, water and heat are in right proportions, the soil is full of life. When the soil is barren, we speak of it as being a 'dead soil,' and when fertile, a 'live soil,' and this is the actual fact. When it is fertile, it is teeming with life. When there is no activity in the bacteria of the soil, it is barren.

Object of Cultivation.

"Many farmers consider the destruction of weeds the important object of cultivation, but this is secondary to the maintenance of those favourable conditions in the soil that will secure the presence of air, water and heat, so related as to promote the highest development of the plant. A favourable temperature is of no value without water. A sufficient water-supply is useless without air and heat. All three are interdependent, and the one most deficient or most in excess controls the activity of the micro-organisms and the life of the plant.

Applying Manure.

"In applying stable manure to the soil organic matter is being supplied for the bacteria to work upon, and to get the most value out of the manure soil conditions favourable to the nitrifying processes must be maintained or much of this valuable promoter of fertility will be wasted.

Soil Water.

"Under Kansas conditions, the greatest factor in crop production is water. It far transcends all other elements or agencies. Eighty per cent. of the corn plant at tasseling; 86 per cent of green clover; 95 to 98 per cent. of cabbage, lettuce, cucumbers, and onions, and 10 to 15 per cent. of air-dry straw or corn-stalks and water. Water aids in dissolving the plant food in the soil. It is the medium of transportation through the soil to the roots. It carries the fluid in solution through the roots and stems to the leaves. It furnishes the hydrogen needed. It assists in keeping the temperature of the plant more equable by its movements from the roots to the leaves to supply the demands of the dry air that evaporates it from the leaves. It gives the needed conditions for nitrification. It is the butler, cook, waiting-maid, and maid of all work in the household economy of the soil. With it all western soils produce profusely, and we rarely find any other element lacking when water is present. The great variations in the annual products of the staple crops testify in amazing figures to the vast importance of the sufficiency of the water supply in the soil, and that the climate is the greatest controlling factor in the produce of the world. whether we look to the semi-arid regions of the great plains of the most favoured regions of England, France, and Germany.

Needed Soil Conditions.

"It is evident that cloudy or baked soils, or hard, compacted sub-soils, cannot maintain the conditions favourable to plant life—that pulverization and mixing are necessary to secure uniformity of texture, presenting the largest water surface and sufficient air space to meet the demands of plant life, and hold a sufficient supply of water within the zone of root growth.

Subsoiling.

"In many of our soils the foot in depth just below the stirred surface soil was naturally compacted, or has become so through many years of ploughing at a uniform depth. Water percolates into it or through it very slowly, and in prolonged heavy rains or in irrigation, the surface soil is not relieved of its surplus water fast enough. This causes over-saturation, and possibly surface washing. Full saturation causes fine-textured soils to settle very closely together, and if not cultivated afterwards at just the right time, rapid evaporation and a hard, baked surface soil follow. In such soils the subsoil plough has proven of great value by breaking up the compacted subsoil, and admitting the water more freely. This prevents the supersaturation and consequent close settling of the surface soil. It is very important to get the water into the deeper soil by passing it along the surfaces of the soil grains without filling up all the spaces between. This better preserves the looser soil arrangement secured by cultivation, lessening danger of baking, and facilitating the natural drying out of the surface soil to check evaporation.

"It usually requires two subsoilings to put the deeper soil in good mechanical condition. Some soils may need it annually, others not oftener than once in three years. Subsoiling is simply a means to an end; a means of reaching a better mechanical arrangement in the sub-surface, and not a substitute for cultivation.

Desirable Soil Conditions.

"After a uniform arrangement of the soil grains has been secured to the greatest depth possible, it is desirable to have a close arrangement in the zone of root growth in the sandy and medium fine soils, and to keep the top three inches in as loose form as possible, to act as a mulch. As already stated, there is a limit to compacting the sub-surface, depending on its fineness.

"If oranges are packed in a box one immediately above the other, through all the tiers the spaces between will be 47·65 per cent. of the box. If the oranges in each tier are moved half a diameter to right or left, then the space between will be reduced to 25·95 per cent., and 10 per cent. more oranges can be packed in the same box. The surfaces of the oranges are not reduced by this change, and would present 10 per cent. more surface in the same box in the latter instance than in the former, and would hold little more than half the quantity of water when fully saturated. The first instance (loose arrangement) fairly represents the condition of the soil if cultivated when moist; the second the condition if cultivated while dry, or when settled by heavy rains or irrigation. This points to the advantage of irrigating fine-grained soils in cultivation by means of furrows, rather than flooding, and probably explains why two or three inches of rainfall extending through 24 hours seems to be much more beneficial than the same quantity falling in one hour.

Humus.

"A rich soil in humus, that is, decaying vegetable matter, has usually a high moisture content. In tests so far made, I have always found that a manured soil, when dry, would take up more water by 10 per cent. than soil from the same field that has never been manured; and if a cubic foot of each is laid side by side and furnished with enough water to equal 25 per cent. the part manured will take and retain the larger share. When a soil loses its humus it is losing its principal source of nitrogen, outside of that obtained through the agency of leguminous crops.

"Soils rich in humus hold the moisture longer against evaporation, and a humus soil, when dry, probably makes the most effective soil mulch.

"Subsoils rich in iron are usually retentive of moisture. For this reason a

red subsoil, if not too sandy, is usually a good foundation for the surface soil to rest on.

The Plant Structure.

"The leaves and stems of plants are made up of innumerable cells just as the soil in which the plant grows is made up of innumerable rock particles, except that the cells in the plant have a more regular, orderly and close arrangement and the spaces between are smaller in value. Each of the myriads of cells in the leaves is a small chemical laboratory. Sunshine and carbonic acid inhaled through the pores of the leaves are agencies that co-operate and combine with the water and the food in solution to convert the crude elements taken from the soil into higher forms available for animal life. Through the agencies named the material for the plant tissues and the perfected fruit or grain are manufactured in and distributed from the leaves. The most essential food elements are taken up by the plant early in its growth, Fully three-fourths of the nitrogen, potash, phosphorus and lime the plant requires are taken up from the soul in the first half of the growth. In the formation of the seed a large part of the nitrogen and phosphorus is transferred from the leaves and stems to the seed grains. Lime, magnesia and other elements are also transferred in less proportion.

Water required by Crops.

"Each plant has its own requirements of water and heat. Wheat, oats, and tame grasses require a soil that will retain 20 to 25 per cent. of its weight of water and a medium temperature for their best development. This means a fine-textured soil, well settled below the surface. Corn and the sorghums do best on a moisture content of 16 to 20 per cent. and a high temperature. Corn roots prefer a thoroughly pulverised soil, not too compact. We always find the fibrous roots of food-gatherers most abundant where the soil was well stirred. Potatoes will thrive on less moisture than corn, but as a rule a good corn soil is a good potato soil. The Kaw valley gives nearly ideal conditions for potatoes. It is rarely fully saturated, does not pack, and mostly will bear settling closely together. As a rule it responds best to level, shallow cultivation while the crop is growing. Only well-rotted manures should be used on these sandy soils. The fine particles of the manure improve the texture. Strawy manure would probably injure it for a season or two. On the other hand, the fine-textured soil, like that on C. J. Norton's farm in Allen county, when settled, holds too much water for potatoes. It needs to be made looser. This, I understand, Mr. Norton has secured by subsoiling and the application of strawy manure, which aids in holding the fine particles apart, giving the soil a more porous character. He may, however, have to cultivate deeper early in the season, especially if the spring is a moist one, than is necessary in sandy soils in order to maintain as nearly uniform as possible the conditions most favourable to the potato.

Evaporation.

"Corn requires about 300 pounds of water to every pound of dry matter; wheat, barley, and clover about 400 pounds, and oats about 500 pounds. A 50-bushel-per-acre corn crop uses about 12½ inches of water. A 30-bushel-per-acre crop (the average of Kansas for 34 years) uses about nine inches of water. The counties around Topeka averaged 40 bushels of corn per acre in 1895, and used about 11 inches of water. This is less than half the rainfall for the five growing months, and less than one-third of its annual rainfall. The remaining two-thirds either pass off in the drainage or by evaporation. Evaporation is a valuable agent in increasing the circulation of the water through the plant, but it is responsible for the greatest loss of water directly from the soil.

Soil Mulching.

"One of the best means for saving soil moisture from evaporation is by shallow cultivation after every rain, but farmers usually limit this to the period of crop growth, and permit waste of moisture after the crop matures. Moisture saving should be kept up the year round, and the farmer who has most moisture in his soil at the beginning of winter will probably have most at the end of winter. Fruit-trees need moisture in the winter time about as much as in the summer, for the root growth for next summer is largely dependent on the moisture present in winter, preparing for the roots that are to form the new growth.

"Surface cultivation to save soil moisture presents one of our greatest problems—how to make the top soil dry, which means making it fine, without losing it by the wind. This method cannot be practised sncccssfully in soils that blow easily, and the practice needs modification. Two cultivations two or three days apart will usually be sufficient to dry the top soil after a heavy shower, so that surface-tension cannot act. A spring-tooth harrow or cultivator with narrow blades is a good tool to use for mulching, because the forward reach of the teeth brings the clods and coarsest soil to the surface, and the vibration of the spring teeth sifts the finer soil down below the surface. It should be the aim of the person cultivating to leave the surface uneven, and covered with lumps and trash around which the wind can eddy and fine soil lodge. In this condition a heavy shower will not pack the surface or wash the soil as badly as when the surface soil is made very fine and level by frequent stirring.

"The suggestions just made apply to crops planted in a row and cultivated, and if it has been difficult to maintain right conditions with cultivated crops like corn and potatoes, what has been the condition of the small grains? What a struggle our wheat and oat plants have had in the past five years contending against a hard, baked surface soil. Under ordinary conditions, it would seem that we will be forced to give relief to the wheat plant or quit growing it. If we cannot safely practise harrowing wheat in the fall after heavy rains, or in the spring under the same conditions, then we shall be forced to plant wheat and oats in drills wide enough apart to admit of being cultivated like corn or potatoes. Under our climatic conditions, there are few types of soils in the State that can successfully carry a crop from September of one year to July of the next without cultivation. It is done only in exceptionally favourable seasons.

Catch-Crops.

"Leguminous crops, like cow-peas, soy-beans or crimson clover, are preferable for catch-crops if they can be successfully grown, but corn sown broadcast, rye, or whatever green crop can be successfully grown, will do. If the catch-crop will not winter it should be turned under in the fall, while green, and the soil packed round it with a disk harrow or roller, followed by the common harrow to loosen the top soil again, or by any tool that will pack the soil around the vegetable matter and leave the top loose. This returns the nitrogen to the soil in the form of humus, to be acted on again by the nitro-organisms that convert it back to nitrogen. This, however, can be better managed by a rotation of crops. Winter wheat following corn, takes up the surplus nitrogen in its fall growth, and prevents its loss that season. After wheat harvest some green crop should be immediately harrowed in, even if the growth is ploughed under within two months, not only to prevent waste of nitrogen, but also to shade the ground during the high temperature of July and August—a trying time on all soils lying bare and fully exposed to it. Under our high-temperature conditions the more we can keep our soil shaded

during the summer months the better, and a growth of weeds following summer crops is preferable to the bare ground, both for shade and storage of nitrogen; but weeds should be turned under while green, and the soil at once packed around them with some tool adapted to this purpose.

"It seems hardly necessary to point out that we cannot go on for ever robbing the soil of organic matter; that the equivalent of all vegetable matter removed should be returned, either in the form of manure or green crops turned under, or by rotation of leguminous crops that alone have the power to take free nitrogen from the air and accumulate it in the soil. Let this valuable restorative come often in the rotation, and our Kansas soils will rarely need to take a stimulant in the form of commercial fertilizers, that may help largely, but only for one season.

"Stable manures, green crops ploughed under and leguminous crops, not only add plant food to the soil but unlock plant food already in the soil. These improve the physical properties of the soil, making the loose soils more compact and the compact soils more friable and loamy. The effects of stable manure can be seen for ten years after the application to the sod. We may value it highly for the food it supplies to plants, but at present, in our Kansas soils, its mechanical value is even greater that its chemical value."—*Agricultural Journal.*

"A MEDICAL SOLON" AGAIN.

THREE weeks ago we had occasion, in the course of an article headed "A Medical Solon," to make some comments on "The Public Health Report for Mid-Lothian," prepared by Dr. Brock, the medical officer of health for that county. This week we have received from one of the leading county councillors in Mid-Lothian a copy of a pamphlet which has been circulated among the Mid-Lothian county councillors on the subject. This pamphlet is entitled, "Comments by the Leading Medical Journals," and it contains articles on Dr. Brock's Report which have appeared in the *Lancet*, the *British Medical Journal*, and the *Sanitary Journal*.

The extract from the *Lancet* is given without a word of explanation, and hence the impression is conveyed to the mind of the reader that the comments on Dr. Brock's Report in that paper is from the editorial pen. But we see from the current issue of the *Lancet* that the comment in question is from a Scottish correspondent, and probably no one will have any difficulty in guessing pretty accurately at the identity of the Scottish correspondent who wrote this apology of Dr. Brock. It was surely a gross injustice to the editors of the *Lancet* to suppress this fact, in view of the opinions expressed in this review of Dr. Brock's Report. This "comment by the leading medical journal" contains the following significant passage:—

"He (Dr. Brook) also refers to the town refuse traffic being a source of much annoyance, and adds: 'Although the city refuse is not supposed to contain human excreta a certain amount is always present. It, however, contains dust from the skins of those affected with scarlet fever, and dried sputa from the respiratory tracts of those affected with diphtheria, measles, and tuberculosis; and it is not surprising that on its coming to a district there at once is found an unusual number of sore throats, if not one or other of the diseases mentioned. Is it not, too, a very likely means of spreading tubercular disease, not only to man, but to the lower animals?' At another part of his report, in referring to an outbreak of typhoid fever, the source of which could not be discovered, he says: 'There is a cause always to be thought of, namely, importation of infection through goods, such as aerated waters, greengroceries,' &c. All these are propositions accepted by the scientific sanitarian,

and it is most desirable that the public mind should be impressed with their accuracy, and that the hands of the public health medical officers should be upheld in their endeavours to make them known to local authorities and to the general public. And yet, while this is so, we regret to see an Edinburgh newspaper ever active to expose what may interest the public, adversely criticising these statements, and makihg comments upon them which certainly convey to the public the impression that the medical officer of health is wrong, and the writer of the article referred to right.

If all these are propositions accepted by the "scientific sanitarian," then the faddism of the scientific sanitarian must have blinded him to the results of the experience of every-day life and work. As every suburban farmer knows, it is utterly incorrect to say that our city refuse coming into a district "there is at once an unusual number of sore throats, if not one or other of the diseases mentioned." Further, it is also a fact that men engaged in the cleansing department who are working among the city refuse from day to day, and from year to year, are as free from sore throats as any other class of the community, not even excepting medical officers of health. As to the alleged "importation [typhoid] infection through goods, such as aerated waters, green-groceries," &c., that is another absurdity. How could the typhoid germ exist in aerated waters after the carbonic acid has been pumped into these waters under high pressure? And how could the typhoid germ exist in green-groceries after these had been boiled before being eaten? If Dr. Brock and the Scottish correspondent of the *Lancet* mean that the typhoid germ might be imported on the outside of the aerated water bottles, or in the green-groceries in the raw state, he might as well say that it might be carried by the clothes of the carrier, and any outbreak of typhoid might be accounted for in that way. The "comments" on this wonderful report by the other "leading medical journals" all show a notable family likeness; and whether they be all from the same hand, and their insertion has been paid for in some way or other, are points we need not concern ourselves with.—*North British Agriculturist.*

NOTES ON REMEDIES FOR SCAB.

We are indebted to Mr. Roe for the following copy of a paper on this subject, which he read at a late meeting of the Graaff-Reinet Farmers' Association:—

"Scab has three aspects in relation to remedies:

"Firstly, there is the killing the scab insect that burrows into the skin and causes irritation.

"Secondly, there is the healing of the damaged skin, resulting from the insect's work.

"Lastly, the prevention, as far as possible, of the insect renewing its attacks, by the qualities of the remedies used.

"Now, how far can we get the best results in all these three classes of service from any one remedy, that shall be safe, speedy, lasting, and inexpensive? Insects of the scab class which bury their beaks in the skin and suck its juices, are not to be got at by poisoning their food, as we would do with a caterpillar or leaf-eater, but are like the scale insect, with its beak stuck into the tree bark or skin of the plant, drawing out its juices. We can only smother or suffocate such insects. Along the sides of a caterpillar you will note a row of minute spots, really pores through which the creature breathes. The scab insect has a similar mode of breathing as it could not breathe through the mouth, when that was buried in the skin. So nature arranges the pores or openings to breathe from, away from the mouth, along the sides of the insect.

"If a little harmless oil or fat be along the caterpillar's sides so as to close

these pores, the insect dies as surely as if you put the mouth and nose of an animal under water.

"One of the first qualities of a dip, is then, that it shall smother or suffocate the scab insect. The bath of the oil will do it, but the cost is out of the question. Now tar is very effective, but it adheres so strongly to the skin and wool, that it is not suitable. Hence our chemists and manufacturers have tried to get from the tar active oily and other fluids that shall have all the smothering properties of tar without its faults. The host of dips used are mainly of this class, as Quibell's, Little's, Hayward's, &c., and so far as killing the scab insect goes, are effective, and if really freed from the adhesive faults of the original tar, are good. Tar, whether distilled from wood or coal, is a very complex substance, and the variety of carbolics, kresotes and liquids of that class, all of them speedy death to insects, will be in varying proportions in this class of remedies for scab, used as dips. None of the class really dissolves when mixed with water, but makes an emulsion a milky-looking mixture. We have seen above that as a killer of the scab insect, they are effective. Now, on the second count, their curative work upon the damaged skin, some of them work fairly well, but there is danger (when the carbolic compounds are strong in the dip, and a large quantity of the dip is held to the skin in the wool) of harm to the stock.

"I have little to say about these dips, as each one must be tried and proved. Their composition is a trade secret, and the user must work in the dark as to how they are likely to affect his stock or their wool. I have given them full credit for their properties in general. They are all antiseptic and so far tend to heal sores and keep flies away.

"On the third count, the preventive power against infection, I think this class of dips does not rank high. The best ingredients are volatile, or change in the sun and air, and the protective influence is short-lived.

"Now this is a very important point, as Mr. Hutcheon says:—'It is in preventing the re-infecting of flocks, where our measures are most defective and most likely to fail.' He says further, that the best authorities consider sulphur in some form in the dip the most reliable, as securing against this re-infection, and being most permanent in its action.

"Let us briefly consider the dips used that contain this sulphur. In the *Agricultural Journal*, vol. v., p. 171, there is an account of a trial of two mixtures furnished to Mr. Davison for trial as scab remedies, and I think a study of this trial will show us what value the different ingredients really have in scab treatment. Mixture A consisted of 14 lbs. of arsenite of soda in 360 gallons of water; (the *Journal* has 4 lbs.; but this must be a misprint).* Now this A would differ but slightly from a solution of your Scrub Exterminator, 1lb. to 25 gallons.

"The report says, that when tried, it did not cure but killed, and was condemned.

"Now Mixture B was the same as A, but mixed with 48½ lbs. of finely ground sulphur to the 360 gallons. Of this, on trial, Mr. Davison reports favourably. It cured and did not kill, although some sheep did die later, but they were very poor, and dipped late, and so their wet jackets kept the arsenical poison longer about them to soak in and do its deadly work. Now it is notable that the arsenical dip killed, but did not cure until the sulphur was mixed with it; and if you compare the B mixture with Cooper's Dip Powder, you will find them very similar.

"Cooper's has 66 per cent. of free sulphur while B mixture has 70 per cent., and both have it mixed in arsenical compounds in about equal proportion. But Cooper's is the less soluble, and so far, better in safety. In

* Possibly. Ed.

Cooper's also there is about 6 per cent. of a compound of soda and sulphur, possessing similar remedial properties as the compound lime and sulphur dip. This gives to Cooper's Dip a place on our second count of quality to cure the sore skin, left by the insects' work,—an important quality. The sulphur in Cooper's Dip undoubtedly gives it value on our third count, the prevention of re-infection and permanence of protective quality. With this before us, we ask, must we have this strong arsenical element of danger, to get a dip that will come well up to the three aspects we have set before us, as needed in a good remedy for scab? It is claimed for arsenic in the dip, that it kills the scab insect, and also has a curative action upon the damaged skin. So far, true. But I may remind you, that for centuries the compound of lime or alkali with sulphur—under its old name of liver of sulphur (so called from the resemblance of the dried stuff to pieces of liver)—has stood foremost as a remedy for diseased skin. Its power as a destroyer of insect and fungoid life is thoroughly well assured; and its changes on the skin of the animal,—continually forming sulphur, in its finest precipitated state (one in which it is most active),—ensures the permanances of its good effects. When you boil in water a mixture of fresh-slaked lime and sulphur, you actually make a solution of this famous liver of sulphur; and it is doubtful if you could find a solution equal to this as a curative for scab,—a quick killer of the insect, and one of the best of the remedies for the damaged, diseased skin; and lastly, as we have seen, depositing sulphur in its best form for remaining on the skin of the animal to act as a preventative of any re-infection. All this without poisonous properties and their frequent risks. I fear there is an impression with many that the lime has much to do with the power of this dip; hence, more is used than needed, and the wool injured, the efficacy of the dip in no way bettered. Cooper's Dip has no lime in it, but sulphur is present, which is true of Mr. Davison's imitations. Then you will say, why not use sulphur without the lime? I will remind you that sulphur in the finest powder it can be ground to, is very inert, and a few grains in a solution will effect as much as ounces in the crude form. In dipping, you seek for the stuff to penetrate every part of the animal's covering, to get its effect on the skin, so that the finer the powder used, the more it will be suspended and mixed through the whole dip. The finest sulphur mixed with water rapidly settles out. Sulphur, as you know, dissolves when it is boiled with lime and water, and so is evenly diffused through the whole and cannot settle out. Wherever the solution or dip wets, the sulphur must be there also; and this is an important property of a good dip,—evenness of distribution. Once on the animal, and exposed to the air, the sulphur begins to be precipitated in the best condition for its work. Here we have the reason for dissolving the sulphur; far less does the work, and does it better, because diffused all about the animal in its most active condition. Then if it is still the sulphur we need, as the remedy for scab, our reasoning points to the necessity of using as little lime as possible, to get so much sulphur dissolved for our dip, then we get the most effective remedy for scab, and the least risk to the wool. I must say something on this point. Often harm is done by want of care in keeping out of the dip all the lime that is not dissolved with the sulphur in the clear yellow dip. But in the best case, with a clear dip, when the wool wetted with it is exposed to the air, the same agent as above spoken of, that precipitates the sulphur, also precipitates a powder of lime carbonate, that adheres to the fibre of the wool and gives it a harsh feel. Here you have another reason for using as little lime as possible in your dip. Caustic soda could be used in place of lime, but would be too expensive. But I would here make a suggestion, for trial by a careful farmer, who had for any reason to dip valuable long-woolled sheep, and that is, for this purpose use soda instead of lime for dissolving the sulphur, and then there would be sulphur

only precipitated afterwards on the wool and skin, but no lime. The slight extra expense for such special case would be a small matter. It would have to be remembered that twice as much caustic soda would be required for dissolving the same weight of sulphur, as compared with lime. As proof of the power of sulphur and lime in dips, I must remind you that scab was cleared out from most parts of Australia before the advent of Cooper's Dip. The Chief Inspector of Stock in Queensland at that time asserts: 'Lime, sulphur and tobacco never fail.' Cooper says the same of his sulphur and arsenic, and both claim protective quality against re-infection, and rightly so. But the sulphur is indispensable for protection, and that there is risk in Cooper's arsenical addition is shown from the well-known danger of soaking rains after dipping with it, keeping up the action on the skin, and holding the arsenic compounds in solution, so that they are absorbed into the animal's system. All agree that however good the dip, it is the system and co-operative working that tells, not the dip alone. Now, dip we shall always have to do, when scab is a thing of the past. We shall wisely dip for lice and ticks, and the health of the stock and their comfort will well repay the trouble. Australians maintain that their annual dipping increased the value of their wool one penny more than that of undipped, uncared sheep. Health and comfort of the animal told on increased growth of wool, and its evenness told on the price, and the oldest and best remedy for scab still came in as the best and safest for dipping for vermin and health of stock. I wish that you were so far out of the wood that this dipping was the only one you needed. I fear such happy days are far ahead, with so much division in your camp against the common foe of scab.

The making of lime and sulphur dip has some peculiarities, which, when understood, ensure its best quality. Lime is very slightly soluble in water; sulphur insoluble; yet, boiled together, both dissolve in considerable quantities. The small proportion of lime in solution dissolves sulphur in the boiling, and combining with it, affords room for more lime to dissolve, and so to continue the process. But the dissolving of the sulphur does not end in this way; because, if the sulphur is in excess, the first portion made of the compound of lime and sulphur will dissolve more of it; so that by boiling longer, on an excess of sulphur, you can get a dip rich in sulphur. This is the dip you must aim at; and on no account should the sediment be used, for should it contain undissolved sulphur, more water boiled on the residue will take it up. This can then be used for more dip, if needed; or the whole of the sediment of lime mixture can be used for cleansing purposes, disinfecting kraals and sheds, or for the garden, being an excellent wash for the stems of vines, or trunks and branches of fruit trees. Should the farmer need to keep the dip over, he can avoid the deteriorating effect of exposure by covering the surface with a thin layer of oil or fat of any kind. Fat put on a pot of warm dip will preserve it for weeks.

"The dip made of soda and sulphur, before alluded to as a suggestion for long wool, where the sheep must be dipped, should not be used at more than half the strength of the usual strong lime and sulphur dip. It is more active, and does not change so rapidly on the sheep by exposure; and the quantity held up by the long wool must be considered in the strength used. As is well known, for the Boer goat, with little covering, strong dip is needed, and full time to act must be allowed, because of this little covering holding so small a portion of the dip; and the long wools can be met by weaker dip, because they keep so large a quantity of it about the animal. In this dip it is easy to see, if you have it saturated with sulphur the whole of the soda dissolves in the water, and it should be boiled on the sulphur as long as it can take any more up; and the sulphur used is the measure of the strength of this dip."—*Agricultural Journal.*

DISHORNING.

AT a test of dehorners made by the Bureau of Animal Industry at Washington, the most effective, and at the same time the cheapest, compound was found to be a kerosene emulsion compounded as follows:—50 per cent. caustic soda, 25 per cent. kerosene, 25 per cent. water. An emulsion of the kerosene and soda is prepared by heating and vigorously stirring; this is then dissolved in water. If applied to a calf before it is 30 days old, it effectually kills the horn. It should be carefully applied to the button, and if not allowed to come in contact with the adjacent skin, is practically painless to the animal.—*Melbourne Weekly Times.*

ANOTHER MEDICAL SOLON.

WE have lately had occasion to expose the intrigue which is being carried on by the Medical Officers of Health with the view of getting the veterinary profession ousted from the work of dairy and meat inspection, which work the properly qualified veterinary surgeon, and he only, is capable of performing in a satisfactory way. In their stupid memorial on the subject, the Glasgow Corporation, which, unhappily, made itself the catspaw of the medical intriguers, one of the arguments used to forward this intrigue was that "Medical men first pointed out the special diseased conditions in cows which entail grave danger to the consumers of their milk." To this declaration the memorialists might have added that a Medical Officer of Health, namely Sir Henry Littlejohn, of Edinburgh, first "discovered" that the "sexuality that bisects all nature" extended even to the bacilli of tuberculosis, and that these bacilli were differentiated into male and female! Of course, this bogus "discovery" has since then been a laughing-stock to the veterinary and medical professions, as well as to bacteriologists in general. Curiously enough, however, a great deal of dubiety has existed even among the medical and veterinary professions as to the only time and place at which Sir Henry Littlejohn announced this great discovery of his. Only the other day we wrote to an eminent Edinburgh doctor, who has made a special study of bacteriology, asking as to the occasion on which Sir Henry Littlejohn had affirmed that the bacilli of tuberculosis were differentiated into male and female. To this letter we received a reply, from which we make the following extracts:—

"No doubt Dr. Littlejohn could give you the information you require, but from the study I have made of bacteriology I do not think he could have possibly stated that there were male and female germs, at least, so far as bacteria are concerned, as these micro-organisms are so simple that no sexual differentiation could possibly occur in them. I must confess that I was surprised to hear that the Doctor had made such a statement as to the sex of disease germs."

At last, however, after a great deal of inquiry, we have been able to exhume from Dr. Littlejohn's own evidence in a court of law his *ipsissima verba* in announcing his "discovery" of the sexuality of tubercle bacilli. The time and place of the Doctor's announcing his great "discovery" was "at Glasgow, within the Old Court, Justiciary Buildings, Tuesday, 28th day of March, 1889, in presence of Robert Berry, Esquire, LL.D., advocate, Sheriff of Lanarkshire," when Mr. Hugh Couper, wholesale butcher, Glasgow, and Mr. Charles Marr, meat salesman, Glasgow, were indicted on a charge of having exposed for sale the carcases of two animals which were alleged to be affected with tuberculosis. A long proof was led on the case, and Dr. Littlejohn appeared as a witness for the prosecution. The following extract, which is given *verbatim et literatim* from the printed report of the trial, gives the terms in which Dr. Littlejohn announced his great discovery:—

"*Dr. H. D. Littlejohn, witness.*

"1094. Mr. M'Kechnie: Will take it that it is the spores. But take the bacilli themselves first; is it not the case that they will die at a temperature of 107 degrees?—I believe so.

"1095. That's what the gentleman who reported last year found?—Yes.

"1096. So that if you were eating cooked food, cooked at 212 degrees, the bacilli would be pretty well in their graves, would they not?—Yes, but what about the spores?

"1097. I am to ask you about the spores. Have you ever seen a spore?—No; never.

"1098. Have you ever seen anybody that has seen a spore?—No; I am not sure that I have.

"1099. Are not the spores just in the air?—They must be in the air beforehand. You cannot have bacilli without spores.

"1100. Why not? If you swallow one, does he always carry a spore along with him?—No, but there is the female bacillus.

"1101. Suppose it were a male bacillus, he would give rise to none?—Of course not, unless he is a hermaphrodite.

That is medical science with a vengeance! No wonder the Edinburgh butchers have cause to complain of the wholesale way in which Sir Henry Littlejohn condemns any and every carcass in which there is the slightest speck of tuberculosis, although the Royal Commissioners, who so fully investigated the whole question, reported that, in cases of localised tuberculosis, the removal of the affected parts was all that was necessary to ensure that the rest of the meat might be eaten with perfect safety to the consumer. Sir Henry, doubtless, has the most implicit confidence in the accuracy of his dicta as to the sexuality of the tubercle bacilli, and the spores generated, either by a bacterial "hermaphrodite" or by the union of a male and female bacillus, must be very dangerous!—*North British Agriculturist.*

SINGLE PAID JUDGES.

For five years now we have been urging the desirability of fewer shows and single judges. Both reforms are gradually gaining adherents, and the latter is in a fair way towards general adoption. It stands to reason that awards will be more carefully given and supported by reasons which can be explained to the exhibitor when a single judge is employed, especially if he is a paid expert, than if the responsibility is divided between two or three judges, who often have to make their awards a matter of compromise, and each has a preference for different types. The weeding out of country shows is a process which shows little signs of making way. Most sensible exhibitors now admit its desirabilily, but local interests are all powerful, and the practical purposes of shows are sacrificed to ther social side, which has the powerful support of the publicans and storekeepers. There is a great deal to be said for the desirability of affording opportunities for meetings of the country side, but these meetings would find some other excuse, such as races, if shows were more centralised. We fear, however, that this is a council of perfection. Meanwhile, if the practices of (1) appointing single judges, (2) paying them as experts, and (3) making them give written reasons for their decisions, become general, the existing shows would become much more useful than they are.—*Sydney Stock and Station Journal.*

Parliamentary Intelligence.

ROYAL COMMISSION ON TUBERCULOSIS.

In reply to Mr. LEES KNOWLES (for Dr. Farquharson),

Mr. CHAPLIN said that the proposed terms of the reference to the second Royal Commission on Tuberculosis were to inquire and report as to what administrative procedures are available, and would be desirable, for controlling the danger to man through the use as food of the meat and milk, with its products, of tuberculous animals, and what are the considerations which should govern the action of the responsible authorities in condemning, or not condemning, for the purposes of food supplies, animals' carcases or meat exhibiting any stage or stages of tuberculosis. He was not in a position at present to announce to the House the names of the members of the Commission, but he hoped to be able to do so shortly.

CALF LYMPH AND PUBLIC VACCINATION.

Sir W. PRIESTLEY asked the President of the Local Government Board whether, in view of the increasing demand for vaccination with calf lymph, he would consider the expediency of at once taking such steps as may be necessary to facilitate the performance by public vaccinators of calf-to-arm vaccination, with the double object of meeting the objections of an increasing number of parents to the use of humanised lymph, and the protection of infants from the danger of attack and death by smallpox?

Mr. CHAPLIN: I am fully aware of the importance which is attached to the performance of vaccination direct from calf to arm when calf lymph is used; but my hon. friend must be aware that a system of calf-to-arm vaccination, if practised generally, would involve an entirely new organisation and a very large expenditure of public money; and since the desirableness of introducing changes for the purpose of removing objection to vaccination or making it more effective is included in the reference to the Royal Commission on Vaccination, who are now engaged in compiling their report, I doubt the expediency of making any proposals as to the alterations in the law and its administration which would be involved before I have had the advantage of considering their report.

THE RINDERPEST IN BECHUANALAND.

Mr. KNOX asked the Secretary of State for the Colonies whether he was aware that hides of animals which had died of rinderpest were being sold to hide merchants in the Bechuanaland Protectorate, and whether he would direct that the carcases of the dead animals should be burnt so far as possible in order to prevent the spread of disease?

Mr. CHAMBERLAIN. I have no information that the hides of the animals referred to in the question were being sold to hide merchants in the Bechuanaland Protectorate, but I have directed that, as far as possible, the carcases of such animals should be either burned or buried with the hides intact.

Mr. KNOX asked the President of the Board of Agriculture what were the regulations concerning the importation of hides from Africa, and what steps he was taking to prevent the introduction of rinderpest in this form into the United Kingdom?

Mr. LONG: It has not hitherto been found necessary to impose any special regulations with referenee to hides imported from countries affected with cattle plague, and, in the case of South Africa, I am advised that, owing to the treatment to which the hides are subjected, the length of time which must

necessarily elapse between their removal from the animal and their arrival in this country, and the fact that when landed they are not brought into contact with living animals or handled by persons likely to come into such contact, there is practically no risk attached to their importation. The subject is one, however, which naturally causes anxiety, and the hon. member may rely upon my keeping it steadily in view, and upon my taking immediate action should any necessity arise.

THE TUBERCULOSIS COMMISSION.

REPLYING to Mr. FIELD,

Mr. CHAPLIN said he hoped to be able to announce the names of the tuberculosis commissioners in a few days.

Dr. FARQUHARSON asked if the right hon. gentleman had received a communication from the Scottish Chamber of Agriculture expressing the hope that he would place a practical Scotsman on the Commission?

Mr. CHAPLIN: I have received that communication, but I think when they learn the names the Scottish Chamber of Agriculture will have no reason to be dissatisfied with the composition of the Commission.

Army Veterinary Department.

Levée.—Veterinary-Colonel J. D. Lambert, C.B., Director General, Army Veterinary Department, attended H.M.'s Levée on the 1st instant, and presented the under-mentioned veterinary officers:—

Veterinary-Lieut.-Colonel J. Kettle; Veterinary-Captains G. H. Fenton, J. Finlayson, G. C. O. Fowler; Veterinary-Lieutenants J. H. Jackson, T. E. W. Lewis, J. D. E. Holmes, W. O. C. Dawson, R. H. Holmes and W. M. Millar.

Veterinary-Major T. Flintoff, 2nd Life Guards, was also presented by the Gold Stick in Waiting.

Extract from London Gazette of June 2nd, 1896.—Veterinary-Major W. Walker is placed on Retired Pay, dated May 29th, 1896. A. C. Wilson, Gent., to be Veterinary-Lieutenant, in succession to Veterinary-Major W. Walker, dated June 3rd, 1896.

Moves.—Veterinary-Captain C. E. Nuthall proceeded to the Curragh Camp on 29th ultimo, with the 1st Dragoons.

The annual dinner of the Army Veterinary Department was held at the Hôtel Métropole on the 19th inst., when the following officers were present:—Veterinary-Colonel J. D. Lambert, C.B., Director-General; Veterinary-Lieut.-Colonels W. B. Walters, C.B., J. H. B. Hallen, C.I.E., H. Thomson, and J. Kettle; Veterinary-Majors J. Reilly, B. L. Glover, G. Durrant, J. C. Dwyer, R. Rowe, J. K. Grainger, J. W. Evans, J. Burton, S. Longhurst, W. B. Spooner, S. Duff-Gillespie, and T. Flintoff; Veterinary-Captains J. D. Edwards, F. Smith, R. H. Ringe, R. Pringle, T. A. Killick, J. B. Savage, R. Moore, F. Raymond, J. T. Dibben, G. H. Fenton, E. Day, L. J. Blenkinsop, T. Marriott, and E. R. C. Butler; Veterinary-Lieutenants F. B. Drage, J. H. Jackson, T. E. W. Lewis, A. C. Newsom, W. N. Wright, W. O. C. Dawson, J. T. Coley, W. M. Millar, A. C. Wilson, and F. S. H. Baldrey; Inspecting-Veterinary-Surgeons J. J. Meyrick, C.B., T. Gudgin, and Veterinay-Surgeon, 1st class, A. A. Jones.

Extracts from Foreign Journals.

UMBILICAL HERNIA AND TETANUS. M. NOCARD'S ANTITETANIC SERUM.

M. PAUL DIEUDONNE writes to the *Recueil* as follows:—We all know how frequently tetanus follows operations for umbilical hernia in colts. In the case of my father and myself, whether we operated with clams, with needles, with elastic ligature, or otherwise, we always had, in spite of all disinfectants, an average of three cases of tetanus in ten operations. But, after all, is there any wound better situated in the horse, placed in more favourable surroundings, offering better conditions for impregnation by and for the subsequent development of the bacillus of Nicolaier than that which results from the operation for omphalocele? Surely not. For this reason I have never failed, since the day when M. Nocard so kindly put his antitetanic serum at my disposal, to vaccinate therewith all the colts on which I was going to operate for hernia; since then my operations have always had the happiest results. In the months of November and December last—a time of year when my father, like many other surgeons of the old school, would never have dreamt of operating for hernia—I treated three colts for this affection. I employed the same process for all three: the animal was cast, placed on his back with his limbs raised; the omphalocele was enclosed in a clam smeared with corrosive sublimate paste; three or four needles were placed across the clams, and the strings of the clams were wetted to prevent them from slipping. That was all.

1st Case.—Colt two years old, very strong, vaccination on day of operation (9th November) and ten days after. Complete recovery; no sequelæ. Tetanus in this village nearly every year.

2nd Case.—Colt nine months old. I was just preparing (12th November) to inoculate this animal when, on opening my box of serum, I found I had brought the tube which I had used on the 9th and which was consequently empty. I was seven miles from home, but, after all, I thought, what was the use of taking so much trouble for a poor little beast nine months old? He would recover all right! I had known of only two cases of tetanus in that village during the past five years, and the last case had occurred two years previously. I merely advised the owner to take great care of him. On the 27th he was seized with tetanus, and died on the 30th.

3rd Case.—A fine colt, ten months old. I vaccinated him on the day of operation (4th December), and again on the 13th. Complete recovery, without sequelæ. In this village, as in the first, tetanus was pretty common.

Are not these observations, collected within a few weeks of one another, very curious, and is not the second especially very startling? My object in publishing them is to urge on veterinary surgeons located in breeding districts always to use injections of antitetanic serum before operating on colts for hernia.

A MORE IMPORTANT USE FOR THE RÖNTGEN RAYS.

IN the adaptation of the Röntgen rays to medical purposes, the chief interest of scientific men has been centred hitherto on the *photographing* of objects, whilst the *direct observation* of them has been neglected. This arose principally from the fact that no one had succeeded in producing fluorescent screens sufficiently sensitive to bring the shadows of objects lying behind them clearly and distinctly into perception. Professor Buka, of Charlottenburg, has now, with the help of the double platino-cyanide of barium, constructed such a screen. By means of it he succeeded in *seeing* a syringe in its case and the contents of a purse, which were held behind the screen. In the same manner were *seen* the bones of the hand and of the wrist, also the bones of a foot

through the shoe. There is not the slightest doubt that this method of direct ocular perception has many advantages over the photographic process. The pictures which one thus sees are, of course, momentary perceptions; but one does not require to annoy the patient under treatment by a more or less extended exposure. Besides, in this way one can examine in a very short time considerable tracts, and, in the case of the introduction of foreign bodies, this saving of time is of great importance, as these have a tendency to shift about. The principal advantage, however, is the simplicity of the process as contrasted with the photographic process, which is still too complicated. (*Deutsche med. Wochenschrift*).

THE ABSORPTION OF MEDICAMENTS THROUGH THE HEALTHY SKIN.

It is generally assumed, as a result of the experiments of physiologists, that the healthy skin does not absorb, or only in a trifling and unimportant quantity, the fluid or diluted medicaments which come into contact with it. Regarding gaseous or easily fusible substances, the best writers are of opinion that they are taken up through the skin, but this kind of absorption is regarded as quite insignificant when compared with pulmonary absorption, and therefore is of little practical use. Two French scientific men, M. Linossier and M. Lannois of Lyons, have, however, recently showed that gaiacol in doses of a few grammes, is absorbed through the skin, and they now say the same of salicylated methyl. This drug, which in the treatment of acute articular rheumatism acts like salts of natrium, is very easily taken in by the skin and expelled through the kidneys and the intestines. The skin suffers in no way. Other medicaments are taken in in the same way; these are such as, in spite of high boiling point in ordinary temperature, possess a certain capacity for volatilisation and for which lung-absorption is almost *nil*. Insoluble substances are as a rule not absorbed; those which are easily dissolved are more easily absorbed by the lungs than the skin. M. Linossier and M. Lannois think it possible to introduce into the organism, a sufficient quantity of medicine for the cure of certain diseases through the skin, and they state that the absorption goes on quite regularly, so that precise measurement of doses is in this just as easy as in the case of intestinal drugs. The advantage they claim for their method is, that digestive processes are in no way interfered with, and they recommend it specially in the treatment of dogs.—(*Acad. de Médecine.*)

PULMONARY CAVITY PRODUCED IN A BULLOCK BY AN EAR OF RYE.

A ONE-YEAR-OLD bullock, without showing symptoms of any particular disease, had been falling off its feed for some time, and was losing in weight. All at once it stopped eating, and its owner, thinking he had to deal with a case of constipation, gave the animal a purgative. Unfortunately the symptoms became so rapidly aggravated that it was determined to slaughter the animal without delay. The owner, frightened by the rapid progress of the disease, and fearing he had to deal with a case of anthrax, asked M. Strebel, of Freiburg, to make a *post-mortem* examination. The blood was red and well coagulated. There were no anthrax lesions in the spleen, or in the heart, or in any of the various ganglions, but a widely-extended irregularity was found in the left lung: a broad fibrinous adhesion attached it to the costal pleura. On incising the posterior lobe, M. Strebel opened up an enormous cavity, containing a dark and very fetid liquid, and in the midst of this was an ear of fresh rye, well preserved, and about six centimètres long; in the remaining portion of the lung there were a great number of small, purulent foci. Ths owner explained that some four months before this event he had given hie

cattle chopped straw and rye. The ear which had caused all the trouble must have been swallowed at that time, and must have got into the larynx, and thence into the trachea. It is probable that the cut end of the ear had been directed backwards, and that it may have thus been able to descend to the air-channels until it reached a pretty narrow bronchia. There it had stuck, and caused the lesions described. It is worth noting that, according to the owner, the animal had never coughed.—*Schweizer Archiv.*

REFLEX EPILEPSY.

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through the shoe. There is not the slightest doubt that this method of direct ocular perception has many advantages over the photographic process. The pictures which one thus sees are, of course, momentary perceptions; but one does not require to annoy the patient under treatment by a more or less extended exposure. Besides, in this way one can examine in a very short time considerable tracts, and, in the case of the introduction of foreign bodies, this saving of time is of great importance, as these have a tendency to shift about. The principal advantage, however, is the simplicity of the process as contrasted with the photographic process, which is still too complicated. (*Deutsche med. Wochenschrift*).

THE ABSORPTION OF MEDICAMENTS THROUGH THE HEALTHY SKIN.

IT is generally assumed, as a result of the experiments of physiologists, that the healthy skin does not absorb, or only in a trifling and unimportant quantity, the fluid or diluted medicaments which come into contact with it. Regarding gaseous or easily fusible substances, the best writers are of opinion that they are taken up through the skin, but this kind of absorption is regarded as quite insignificant when compared with pulmonary absorption, and therefore is of little practical use. Two French scientific men, M. Linossier and M. Lannois of Lyons, have, however, recently showed that gaiacol in doses of a few grammes, is absorbed through the skin, and they now say the same of salicylated methyl. This drug, which in the treatment of acute articular rheumatism acts like salts of natrium, is very easily taken in by the skin and expelled through the kidneys and the intestines. The skin suffers in no way. Other medicaments are taken in in the same way; these are such as, in spite of high boiling point in ordinary temperature, possess a certain capacity for volatilisation and for which lung-absorption is almost *nil*. Insoluble substances are as a rule not absorbed; those which are easily dissolved are more easily absorbed by the lungs than the skin. M. Linossier and M. Lannois think it possible to introduce into the organism, a sufficient quantity of medicine for the cure of certain diseases through the skin, and they state that the absorption goes on quite regularly, so that precise measurement of doses is in this just as easy as in the case of intestinal drugs. The advantage they claim for their method is, that digestive processes are in no way interfered with, and they recommend it specially in the treatment of dogs.—(*Acad. de Médecine.*)

PULMONARY CAVITY PRODUCED IN A BULLOCK BY AN EAR OF RYE.

A ONE-YEAR-OLD bullock, without showing symptoms of any particular disease, had been falling off its feed for some time, and was losing in weight. All at once it stopped eating, and its owner, thinking he had to deal with a case of constipation, gave the animal a purgative. Unfortunately the symptoms became so rapidly aggravated that it was determined to slaughter the animal without delay. The owner, frightened by the rapid progress of the disease, and fearing he had to deal with a case of anthrax, asked M. Strebel, of Freiburg, to make a *post-mortem* examination. The blood was red and well coagulated. There were no anthrax lesions in the spleen, or in the heart, or in any of the various ganglions, but a widely-extended irregularity was found in the left lung: a broad fibrinous adhesion attached it to the costal pleura. On incising the posterior lobe, M. Strebel opened up an enormous cavity, containing a dark and very fetid liquid, and in the midst of this was an ear of fresh rye, well preserved, and about six centimètres long; in the remaining portion of the lung there were a great number of small, purulent foci. Ths owner explained that some four months before this event he had given hie

cattle chopped straw and rye. The ear which had caused all the trouble must have been swallowed at that time, and must have got into the larynx, and thence into the trachea. It is probable that the cut end of the ear had been directed backwards, and that it may have thus been able to descend to the air-channels until it reached a pretty narrow bronchia. There it had stuck, and caused the lesions described. It is worth noting that, according to the owner, the animal had never coughed.—*Schweizer Archiv.*

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A DANGER OF CLOVER.—The intestinal calculi and hair balls of horses and cattle are well known, but Mr. F. V. Coville, of the United States Department of Agriculture, has recently called attention to a new source of trouble in the hairs of the calyx of the crimson clover, *Trifolium incarnatum*. Up to the time of flowering these hairs are soft and flexible, but they afterwards become stiff and almost needle-like in character. If hay made from over-ripe clover is fed to cattle, these hairs, which are barbed, form balls of a tough, felt-like consistency three or four inches in diameter, which ultimately cause death through peritonitis or some related ailment. The first deaths from this cause in the United States were noted in 1895, and farmers are cautioned against allowing this clover to become too ripe before making it into hay. The tops of the spineless cactus, *Anhalonium Lewini*, of Southern Texas, which contain an active poison, serve as articles of trade among the Indians, who use them as an intoxicant or stimulant during their dances or religious ceremonies. Mr. Coville considers that, in the absence of spines, this bitter, poisonous property serves as a protection against animal enemies.

THE HORSE'S HOOF.—The hoof of quadruped mammals is so unique in its way that any contribution towards a knowledge of its histology and development is always welcome. Professor Mettam, in his presidential address to the Scottish Microscopical Society, published *in extenso* in *The Veterinarian* of the current year, gives an account of his original observations on the subject, and lays special stress on the mode of development of those horny lamellæ which are to be seen running in a vertical direction on the inner surface of the wall of the hoof of the horse. The surface of contact of the corium or dermis with the epidermis is, in the early stages of development, smooth and devoid of ridges. This has always been assumed in the past, but it has been left for Professor Mettam to demonstrate the fact, and to fix the age at which it is most clearly seen, viz., at seventy or eighty days in the case of the equine fœtus. When the corrugations first appear in the surface of contact, they arise by the dipping of the rete Malpighii of the epidermis into the corium, and not by outgrowths of the corium into the epidermis, as has hitherto been held. The horny laminæ are the cornified cores of these epidermal ingrowths, and remain standing out from the inner surface of the wall of the hoof after the removal, by maceration or other artificial means, of the uncornified inner layers of the epidermis. The laminæ are simple at first, but secondary ridges soon develop upon the lateral surfaces. Professor Mettam also gives an account of the Pacinian and other corpuscles found in the sensitive frog of the foot, and the comparison which he draws between the histological structure of the sweat glands of the horse's frog and that of the interdigital glands of the sheep and the ceruminous glands of the external ear, is interesting.

BACTERIA IN MILK.—At a recent meeting of the Edinburgh Royal Society, a communication on bacteria in milk as supplied in Edinburgh, and the relative efficiency of different methods for their removal, by Dr. Hunter Stewart and Dr. J. Buchanan Young, was read by the former. Dr. Hunter Stewart said that in all civilised countries the Legislature had taken steps to prevent the watering of milk; but perhaps it was of greater importance that children as well as adults should be preserved from those diseases which were produced by the presence of micro-organisms in milk. Cowhouses in this country were not kept with that careful and punctilious cleanliness with which they were kept in Holland and Denmark. The animals were not groomed, the cowsheds were not flushed with water so often as they ought to be; the hands and clothing of the milkers were not properly attended to, nor were the teats of the udder cleaned. In November, 1894, experiments were begun in Edinburgh, and continued until now. More than 300 samples of milk were examined from 50 dairies, widely scattered over the city. It was found that

at three hours after milking there were, on an average per cubic centimètre, in winter 24,700 bacteria in spring and early summer 44,000, and in late summer and autumn, 173,000. It was found that in dairies supplied by milk from the country, the average number of micro-organisms five hours after milking was 41,000 per cubic centimètre, while in dairies supplied by milk from the town byres the average was 352,000 per cubic centimètre. This fact illustrated the importance of having cowsheds outside of the city. In discussing the various methods of sterilising milk, it was pointed out that the great objection to the use of sterilised milk was the change of its flavour and, according to many, its decreased digestibility. The conclusions were that milk kept for one hour at 212° in bottles hermetically sealed, remained sterile for more than a month, and was quite sweet and palatable, though it had a boiled taste; that milk heated by means of Dr. Cathcart's apparatus remained quite sterile for forty-eight hours, though the boiled taste was marked; that milk kept for thirty miniutes at 158° Fahr., was quite sterile at the end of twenty-four hours, and contained very few microbes at the end of forty-eight hours. In all these three methods the micro-organisms of tubercle and diphtheria were certainly killed. Scalding at 176° Fahr., with every precaution, kept the milk sterile for twenty-four hours; but in carrying out this process on a large scale, there was considerable risk of post-scalding contamination, so that there was no guarantee that the bacillus of tubercle and diphtheria, if present, was destroyed.

Reviews.

PROSPECTUS OF THE LAHORE VETERINARY COLLEGE FOR THE YEAR 1896.

We have received the prospectus of the above college, which was established some few years ago for the purpose of affording a means by which the natives of Northern India might be instructed in veterinary medicine and surgery. From what we can gather, Veterinary-Captain J. A. Nunn—a frequent and valued contributor to our JOURNAL, and Principal of the above college—has no need to feel ashamed of the course of instruction followed at this institution.

An entrance examination must be passed by all intending students, and the curriculum extends over two complete summer and winter sessions, the length of a session agreeing very closely with that of a session in a British school.

The list of subjects to be mastered is sufficiently full when we find that it includes anatomy and physiology, materia medica, chemistry, bovine medicine, veterinary obstetrics, equine medicine, stable management and practical horse-shoeing.

A number of scholarships are awarded annually to deserving students.

It is interesting to note that in the final examination it is necessary that a student obtain "40 per cent. marks in each subject and 50 per cent. of the total" in order to pass.

OUTLINES OF VETERINARY ANATOMY. PART I.—THE ANTERIOR AND POSTERIOR LIMBS. By O. CHARNOCK BRADLEY. pp. 183. 4s. (Baillière, Tindall, & Cox, London.)

This book, as the author indicates in his preface, is intended to supply the main facts of the anatomy of the limbs of the horse, and other domesticated animals, in a concise form, suitable for students preparing for their examinations. "No pretensions are made to originality (other than of treatment) or

completeness, and it is intended that this little work shall be used in conjunction with the larger standard text-books." So employed its utility, we think, will be considerable, especially as the examination approaches, and when time does not allow of the perusal of the more bulky manuals.

The chief facts and names are brought out by different kinds of prints and the employment of frequent headings; this should considerably facilitate reference.

The book contains some thirteen original diagrams of simple, but rather novel, conception.

The literary style is hardly based upon that of our best writers; in fact, in places it tends to become "telegraphic," but that is hardly avoidable in books where a mass of matter is condensed into the smallest possible compass.

The publishers announce that the whole work is to be completed into three parts; Part II. to deal with the trunk, and Part III. with the head and neck. The publication in parts will be found convenient when a student is dissecting, for then it will not be necessary for him to encumber himself with a book containing matter which, for the moment, is of little use to him.

Correspondence.

THE PRELIMINARY EXAMINATION.

SIR,—Having passed the preliminary myself, I am extremely anxious that this examination should now be made as stringent as possible. The very legend on our crest might have been framed with a prophetic eye for our guidance—*Vis unita fortior*—which is as much as to say, our strength is increased by having nothing (including certificates) divided. I now regard divided certificates—and divided skirts, too, for the matter of that—as debased and degraded, and feel convinced that the progress of the profession, the advance of our social position, nay, our very existence, is somehow wrapped up in this question. I don't mean to say that I can explain why it is so myself, but a great deal cleverer men than I am say so, and even go the length of falling out in asserting it.

Haven't the profession, too, at the recent election declared the same thing, and showed, by respecting the ex-president, that they deem a suspicion of want of soundness on this point as an efficient bar to a seat on the Council, no matter what efforts the candidate may have made for the furtherance of our common interests, or what services he may be capable and willing to tender. I notice that some of the recently elected eleven have been publishing letters of thanks to their supporters, and they have taken advantage of the opportunity to furnish the examiners who set the questions for the preliminary with examples of "Exercises to be corrected."

One letter of thanks in last week's *Record*, for example, is evidently so intended; anyhow, it contains the following paragraph, which would certainly answer for the purpose:—"I am convinced the best interest of all concerned demand the passing of the preliminary examination at one sitting, and certainly no lowering of the standard."—Yours truly,

VIS UNITA FORTIOR.

Communications, Books, Journals, etc., Received.

Recueil de Médecine Vétérinaire (Alfort); La Presse Vétérinaire (Paris); Le Bulletin Vétérinaire (Orleans); L'Echo Vétérinaire (Liége); Annales de Médecine Vétériniare (Brussels); Berliner Thierärztliche Wochenschrift (Berlin): La Clinica Veterinaria (Milan); Il Nuovo Ercolani Pisa); La Revista Veterinaria (Buenos Aires), etc., etc.